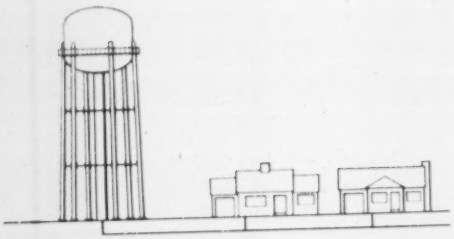
ENGINEERING NEWS-RECORD

A McGRAW-HILL PUBLICATION

better water service for **ANY** *community*

LARGE or Small



- **Opelika, Alabama** (population 9,000). Water pressure in the distribution system varied from 60 lbs. to 30 lbs. per sq. in. before a 1,000,000 gal. Horton elevated tank was erected. Now the pressure is maintained at approximately 60 lbs.

- **Columbia, Missouri** (population 10,000). The 1,000,000 gal. Horton elevated tank has sufficient capacity so that high service pumps may be shut down during a 3 to 4 hour period in the evening when the peak load is on the municipal power plant. The tank is refilled during off peak periods, reducing power costs.

- **Washington D. C.** (population 800,000). A 2,000,000 gal. Horton elevated tank provides a reserve of water, independent of pumping, to supply increasing consumption in a rapidly expanding demand area and to relieve low service suction at peak demand withdrawals for high service pumping.

Above: 500,000 gal. Horton elliptoidal bottom water tank (100 ft. to bottom) at West Memphis, Arkansas, (population 3,570). Horton elevated tanks are built in standard capacities from 500,000 to 2,000,000 gallons. All municipal installations are built in accordance with American Water Works Association specifications.

CHICAGO BRIDGE & IRON COMPANY

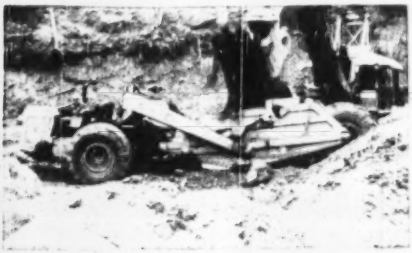
Atlanta 3 . . . 2725 Healey Building
Birmingham 1 . . . 1520 North 30th Street
Boston 10 . . . 1672 Statler Building
Chicago 4 . . . 2101 McCormick Building
Cleveland 15 . . . 2201 Guildhall Building
Dallas 2 . . . 2-306 Fair Building
Denver 2 . . . 1616 Welton Street
Houston 2 . . . 2100 National Standard Building
Los Angeles 14 . . . 1149 South Hill Street
New York 6 . . . 165 Broadway Building
Philadelphia 3 . . . 1625 Walnut St. Building
Salt Lake City 1 . . . 1212 Walker Bank Building
San Francisco 4 . . . 1212 22 Battery St. Building
Seattle 1 . . . 1312 Hoge Building
Tulsa 3 . . . 1617 Hunt Building
Washington 6 . . . 100 Lafayette Building

Plants at BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE

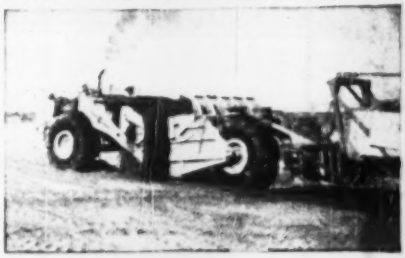
In Canada: HORTON STEEL WORKS LIMITED, FORT ERIE, Ont.

LaPLANT-CHOATE

. . . the sure sign of more and more profitable earthmoving jobs!



HERE'S the sure sign of the extra yardage production that gets the job done faster and at lower cost on more and more jobs. Watch LPC Motor Scrapers in action . . . talk to the men who own them. Then ask your LPC distributor to explain *all* the big-production, high-profit features. LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa—LaPlant-Choate Sales and Service, 1022 77th Ave., Oakland, Calif.



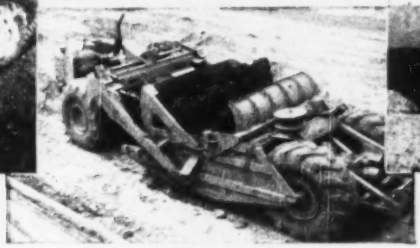
LAPLANT-CHOATE One of the ways J. Robert Baxley uses Motor Scrapers for coal stripping at Mt. Carmel, Pa.

LAPLANT-CHOATE Brown Construction Co. is piling up high yardage totals at Deming, New Mexico.

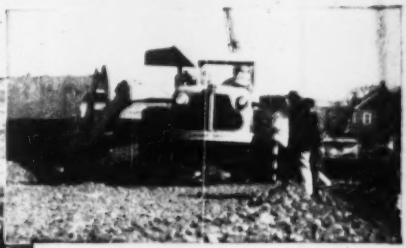
LAPLANT-CHOATE Henry Doelger picks 4 Motor Scrapers to move 12 million yards of sand at Westlake, Calif.

LAPLANT-CHOATE Two LPC Motor Scrapers are working for Bayer & Mingolla on the Route 2 by-pass, Leominster, Mass.

LAPLANT-CHOATE Four LPC Motor Scrapers are speeding operations on the Benbrook Dam for List & Clark, Ft. Worth, Texas.



LAPLANT-CHOATE For the Burlington Railroad relocation project at Chillicothe, Mo., Perry McGlone uses five Motor Scrapers.



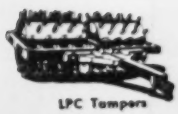
LAPLANT-CHOATE Patterson Construction Company has three units working on the Pennsylvania Turnpike at Stoneton, Pa.

LaPLANT-CHOATE

LPC TW-300 Motor Wagons

LPC Hydraulic or Cable Operated Dozers

LPC Rippers



LPC Tampers

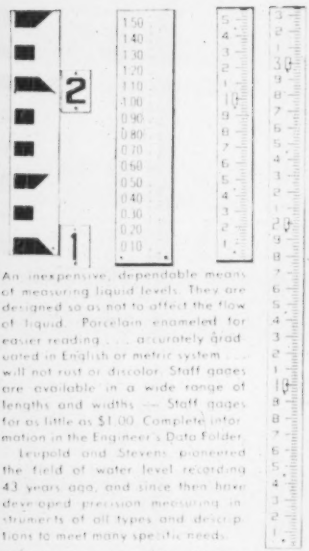
ENGINEER'S FILE ON HYDROGRAPHIC INSTRUMENTS

STEVENS
HYDROGRAPHIC INSTRUMENTS

A wide range of precision measuring instruments to record and indicate head, flow, and totalize flow; for waterworks, sewerage, irrigation and industrial uses. New, low cost methods of liquid level recording.

These methods and instruments for all liquid measuring problems are listed in a complete Engineer's Data folder for your convenience. This information folder is FREE and can be had by filling in the coupon below. The folder includes data on instruments to record fluctuations of liquids in oil production; stream gaging; deep wells; sewage, irrigation, etc., both accurately and economically.

STAFF GAGES



An inexpensive, dependable means of measuring liquid levels. They are designed so as not to affect the flow of liquid. Porcelain enameled for easier reading . . . accurately graduated in English or metric system . . . will not rust or discolor. Staff gages are available in a wide range of lengths and widths — Staff gages for as little as $1.00. Complete information in the Engineer's Data Folder.

Leupold and Stevens pioneered the field of water level recording 43 years ago, and since then have developed precision measuring instruments of all types and descriptions to meet many specific needs.

Write for the complete file. There may be a measuring device that exactly suits your specific requirements. Use the coupon below.

Please send me the Engineer's Data Folder with complete information on Hydrographic instruments.

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ENGINEERING NEWS-RECORD

Volume 144 JUNE 1, 1950 No. 22

WALTER C. BOWMAN
Editor

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ENGINEERING NEWS-RECORD ... Vol. 144, No. 22

B.F.Goodrich

ALL-NYLON tire record:

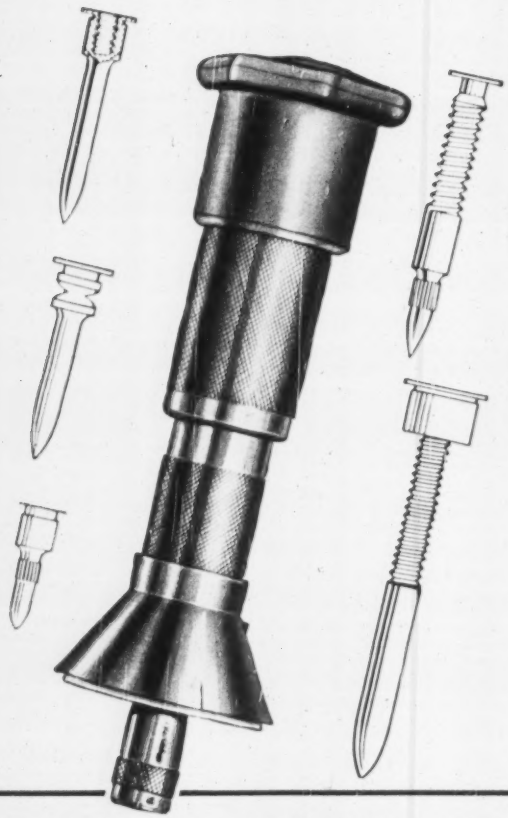
no blowouts, no bruise breaks, no flex breaks!

THE B.F.Goodrich ALL-NYLON tire is proving successful on construction projects all over the country. The record speaks for itself—up to now, no blowouts, no bruise breaks, no flex breaks! And that includes severe operating conditions on jobs where flex and bruise failures formerly were common.

Along with nylon, B.F.G uses wet-less construction, no cross-threads in the plies to hamper cord action and allow some cords to stretch out. Then tire tire growth is reduced—tires last longer.

Nylon tires always provide big savings on construction projects, in quarry and other operations where heavy loads and rough terrain have made tire costs high.

The new, all-nylon construction is typical of the continuous improvements being made in tires by B.F.Goodrich. Long ago, B.F.G engineers developed special types of tires for construction and other off-the-road service. For more information on the way B.F. Goodrich tires can do more work and save you money, call your B.F.G dealer or write directly to *The B.F. Goodrich Company, Akron, Ohio.*



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Push costs down and profits up by using fast, sure RAMSET SYSTEM for most fastening jobs in steel or concrete. Sturdy, dependable RAMSET TOOL instantly sets any one of 65 drive pins or threaded studs. No muss, no fuss, no trouble.

Cost-saving and time-saving advantages of RAMSET are being proved every day by thousands of users . . . with time and costs cut as much as 70%, over old fashioned methods.

Ask for a 15 minute demonstration and proof of RAMSET'S ability to outwork less efficient driving tools. Call your local RAMSET Specialist or ask us for details.

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PIONEER IN POWDER-ACTUATED FASTENING

NEWS BRIEFS

Take it easy. The brand new $27,000,000 Mystic River Bridge just opened, blessing officials of Chelsea, Mass., told the state. The city, it declared, can't stand alone much longer against the terrific impact of the traffic the bridge dumps on its narrow streets. State aid is requested.

California Needs YOU. Los Angeles wants the finest possible help to operate Hyperion, its new, $41,000,000 activated sludge sewage treatment plant. It went into partial operation May 15. Applications from experienced people covering education and experience should go to the Civil Service Commission, Room 5, City Hall, Los Angeles, 12. Examinations, originally held there, will be conducted elsewhere as specialty or scholarship personnel shortage exists.

Doesn't Seem Possible. North Carolina highway officials' guidance becomes more dangerous, not that they're doing good. Next year, under the completion of Inland Lines, for its 4,000 miles goals campaign. Installation of safety devices will be governed by the ratings.

Boston Parking. Off-street parking plans in Boston call for expenditure of $50,000,000 in the next 10 and one half for establishment of 100 downtown lots. First municipal spaces will be unveiled soon, a project of $2 [illegible] to accommodate [illegible] cars.

AGC Won't Like It. Virginia plans to [illegible] more than 2,500 miles of [illegible] and during the next year. Hill et [illegible] to [illegible] done for contract. Bids [illegible] Virginia. About 1/5 of the [illegible] system will be [illegible].

Action in Philadelphia. City officials have approved [illegible] for the [illegible] building at Philadelphia [illegible] and Vine. Contracts for the structure have been awarded to [illegible] over-all $27,000,000. Other [illegible] $2,500,000 [illegible] other [illegible] [illegible].

Swords Into Plowshares Note. [illegible] Contract Cancellation Board [illegible] ESL [illegible] Virginia [illegible] Washington Council [illegible] Contracts [illegible] ESL [illegible] [illegible].

Won't Know the Place. [illegible]

Before you buy

a diesel engine

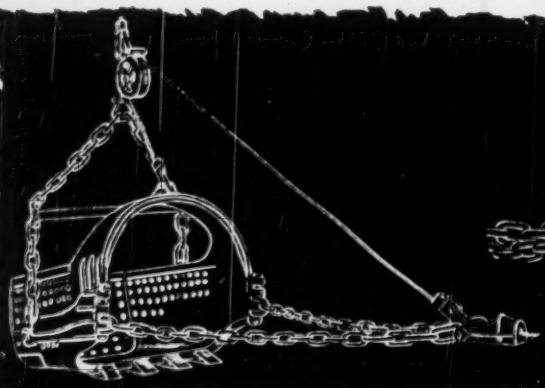
...be sure and read this booklet!

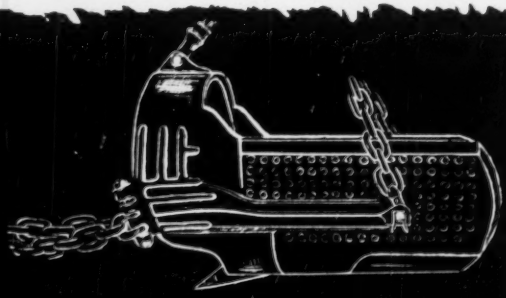
A sound basis of comparison is essential to the selection of the proper diesel engine to meet your power requirements. And that's just what the booklet *"10 Questions to Ask a Diesel Engine Salesman"* gives you. If you want economy, dependability and long engine life this booklet will show you what to look for in a diesel engine.

In addition, the *"10 Questions"* booklet describes fully the Murphy Diesel line of heavy duty "true" diesel engines, giving design details and basic specifications. No diesel power user or prospective diesel power user should be without this helpful 28-page booklet. Write for your copy, mentioning your company affiliation and position.

MURPHY DIESEL COMPANY
5311 W. Burnham St., Milwaukee 14, Wisconsin

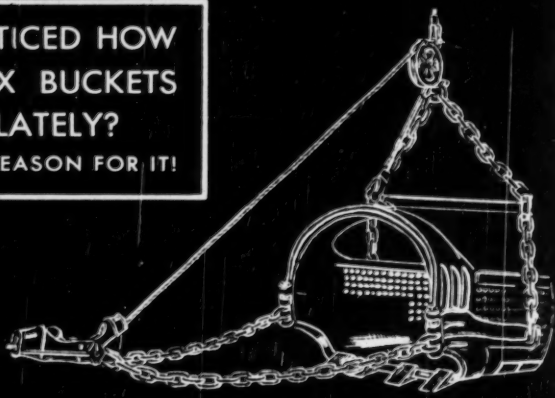
Heavy duty power
for construction
Murphy Diesel Engines and Power Units for construction, 90 to 220 H.P. Generator Sets, 60 to 133 K.W.

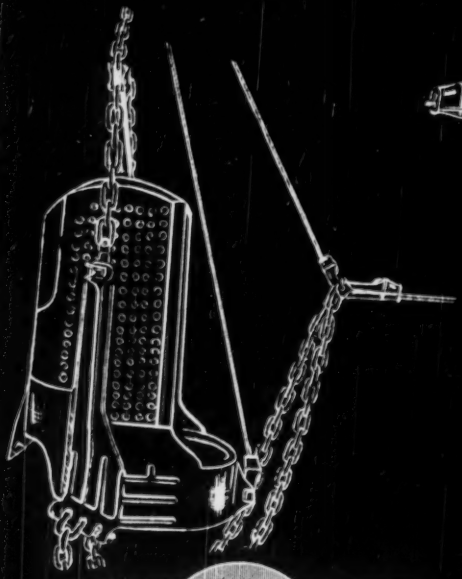




HAVE YOU NOTICED HOW MANY HENDRIX BUCKETS *you've* SEEN LATELY?

MUST BE A REASON FOR IT!





HENDRIX

Lightweight **DRAGLINE BUCKETS**

For descriptive literature ask your dealer or write

HENDRIX MANUFACTURING CO., INC.

MANSFIELD — LOUISIANA

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COPYING COSTS WITH A METHOD THAT'S

60 Times Faster?

...and many times better than old-fashioned "copying"

IT'S OZALID...

the *speedy copying process* that reproduces anything typed, drawn or written. You get perfect copies of letters, records, reports, photographs, index files, drawings—anything.*

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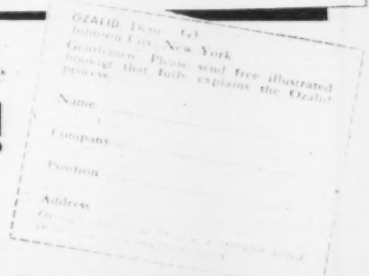
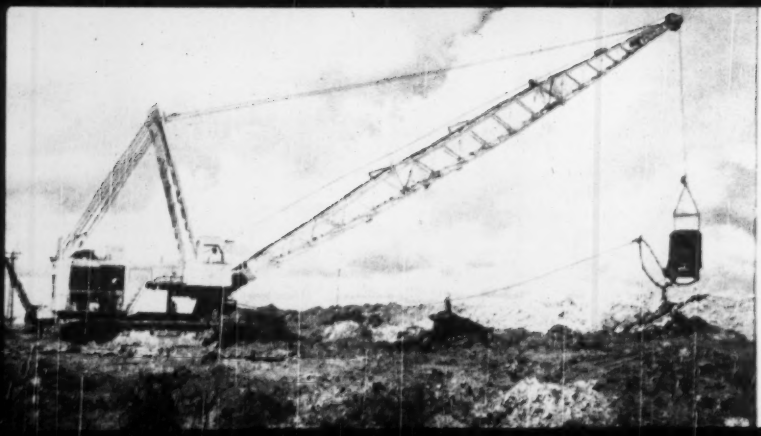


A DIVISION OF GENERAL ANILINE & FILM CORPORATION. "FROM RESEARCH TO REALITY"

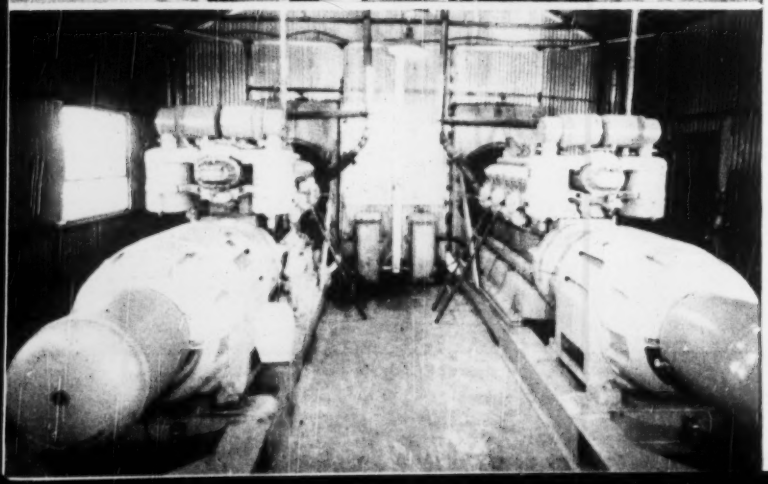


A D386 "Cat" Engine powers this Manitowoc dragline, with 6-yd. bucket and 120-ft. boom, building levee on Galveston Bay. Owned by McGinnes Bros. Construction Co., Houston, Texas.

"Cat" Engines

BUILT

This crushing plant, owned by Arthur R. Alvis, Butler, Mo., has a "Caterpillar" D375 Engine driving a Universal pulverizer. Capacity, 125 tons of road rock per hour.



Two "Cat" D397 Electric Sets, each with capacity of 314 kw., furnish light and power for Cedar Bluff Dam construction job. Contractors, Lytle-Amis & San Orr, Ellis, Kans.

BACK of the high preference for "Caterpillar" power on construction jobs is a long experience of profitable operation.

Construction men know they can depend on steady, day-in-day-out performance from "Cat" Engines and Electric Sets. And they know they'll get 24-hour service—anywhere—from "Caterpillar" dealers.

The right power for every type of job is now available in the complete "Caterpillar" line. There are ten Engines, ranging in size up to 500 hp. (maximum), and ten Electric Sets, up to 314 kw. (12-hour duty).

Over 150 manufacturers make "Cat" Engines available as power for their equipment. They know that quality power adds to the performance of their product—gives greater satisfaction to the user.

When you order new construction equipment, specify "Cat" Diesel power. Your "Caterpillar" dealer will be glad to *show* you how the big yellow machines will meet your requirements.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

FOR CONSTRUCTION MEN

LOOK UNDER THE HIDE

for the quality that pays off in performance!

The built-in quality of "Caterpillar" Diesel Engines doesn't show on the outside—but it shows up in performance. Just take a few examples of the hundreds of hidden quality features that give "Cat" Diesels their long life and dependability.

"Caterpillar" intake and exhaust valves are made of highly alloyed, heat-resistant steels. Their ample size and close machining and heat treat specifications have resulted in thousands of hours of trouble-free valve operation. Valve and rocker arm design are matched to reduce wear. Valves in the D397, D386, D375 and D364 Engines have special hard facings on contact surfaces, and have valve rotators and hardened valve seat inserts to reduce seat wear.

Fuel pumps are "Caterpillar"-designed and "Caterpillar"-built. Made of the cleanest high-chromium, high-carbon alloy steel obtainable, the pump plungers and barrels are diamond lapped. Pumps are heat treated to maximum hardness to give users thousands of hours of trouble-free, economical service. There is an individual pump for each cylinder. Pumps are free from adjustment and interchangeable.

The fuel injection valve offers owners maximum simplicity in design. Machined to extremely close limits, these valves are made from the finest quality materials—and are subjected to very detailed hardening processes. Valves are completely interchangeable and are adjustment-free. A large single orifice minimizes fouling. With the matched design of valves and precombustion chambers, owners use low-cost, non-premium fuels to get top economy.

CATERPILLAR

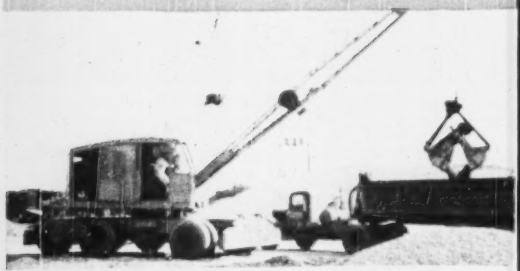
REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

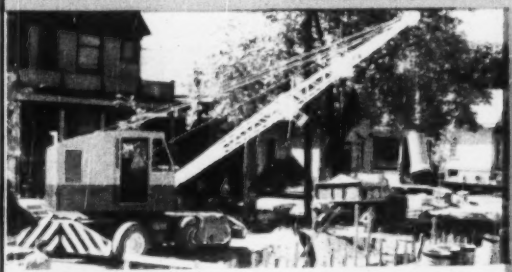
Reduce TRAVEL TIME...

MOBILE TRUCK HOE — for short-duration excavating jobs, you can turn travel time into extra work time with 35 m.p.h. truck-mounted hoe or shovel. ¾-yd. 304 illustrated. ½-yd. 205 also is available.

HEAVY-DUTY DRAGLINE — Extra reach and heavier lift capacity of truck-mounting give the Koehring 304 plenty of operating stability for handling oversize dragline buckets and wide work range.



ONE-MAN CRUISER — With Koehring 304 on cruiser-type mounting, you have economical one-man handling and 4.8 m.p.h. shuttle speed for crane and clamshell. Both work and travel controlled from cab.



FAST-SHUTTLING 304 Cruiser saves time on pipe installations, bridge construction, on docks, around industrial plants, railroad and lumber yards, where machine moves from one location to the next.

Increase LIFT CAPACITY

Use Koehring ON RUBBER . . . .

For setting steel on quick excavations, or anywhere travel time is an important percentage of job duration, it pays to use the Koehring truck-mounted 205 or 304. These mobile, rubber-tired units cut non-productive moving time, roll along at 30 to 35 m.p.h. — get to job fast, start work sooner, move on to next job quicker. No waiting for trailer, no loading and unloading delays, no planking.

304 LIFTS 25 TONS

Next, consider the increase you get in lifting capacities. Koehring 304 Truck Crane safely lifts up to 50,000 lbs. — 11.1 tons more than its crawler rating. The smaller heavy-duty 205 Truck Crane handles 20,000 lbs. — 2¼ tons over crawler capacity.

110-FOOT REACH

Extra stability of truck mounting also increases boom length. Reach on the 304 steps up from 75 to 110' maximum with jib — and boom on the 205 Truck Crane increases from 50 to 85' with jib. Hinged booms fold back for ample travel clearance, save more time every move.

3 BIG GAINS

Figure what these three big gains — in extra speed, extra capacity, and extra reach — can mean on **your** jobs! Remember, too, both the Koehring truck-mounted 304 and 205 are fully convertible from lift crane to dragline, clamshell, pile driver, shovel and hoe. That extends the speed and mobility to **all** of your materials-handling work.

. . . CHECK THESE KOEHRING PRODUCTS WITH YOUR JOB REQUIREMENTS . . .

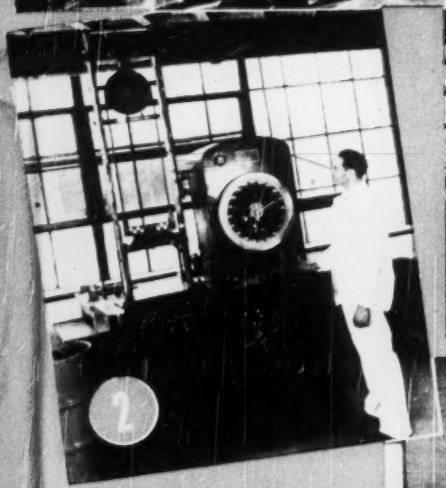
Other heavy-duty products in the big Koehring line include 1½ yd. excavator with 36 ton lift capacity, 2 cu. yd. with 79½ ton lift, 6 yd. Dumpster® for high-speed, no-turn shuttle hauling, 2 sizes Tamper® Pavers — mobile 16 E on rubber tires, and big production 34 E on crawlers. Longitudinal Finisher, tilting and nontilting Construction Mixers up to 4 yds., and Mud-Jacks®. Your Koehring distributor can give you complete information.

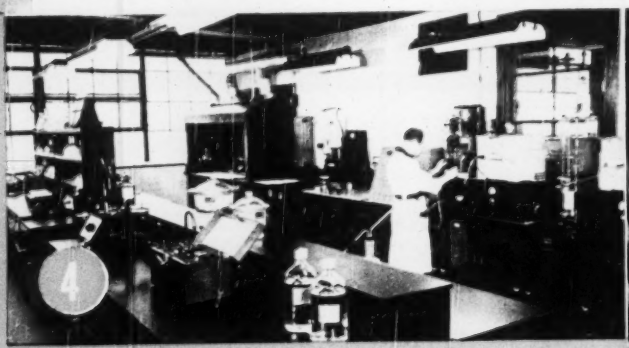
Steady, safe operation is assured with independent boom hoist, power-boom lowering, telescopic boom back stops, clutch throw-out boom limit stops on all Koehring Truck Cranes. Self-adjusting main clutches make tension changes automatically. Mechanical booster clutch on 304 reduces normal lever pull more than 50% for the operator and retains "feel" of load.

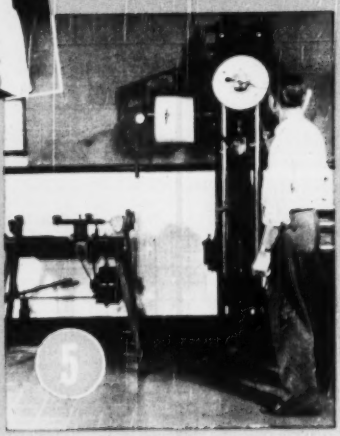
KOEHRING HEAVY DUTY

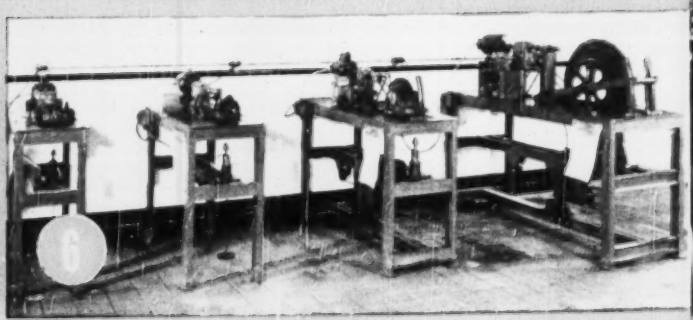
KOEHRING COMPANY
Milwaukee 16, Wisconsin
SUBSIDIARIES: PARSONS • KWIK-MIX • JOHNSON

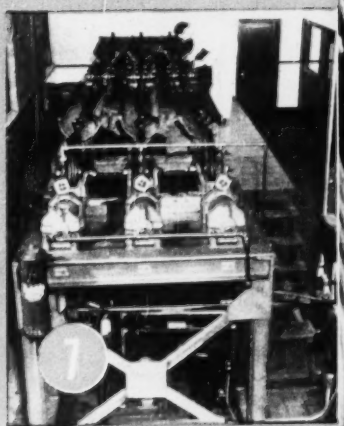
how











Wire Rope Problems are Studied in the Field... and Whipped in Union Wire's Outstanding Research Laboratory by Technical Experts

Not content to sit back and make wire rope as it has always been made—just because it has always been made that way—

Union Wire Rope engineers continuously study problems in the field—bring them into the outstanding Union Wire Rope laboratory—and keep them under constant research until whipped and tested in the field.

The result is a growing line of new wire rope constructions, designed for specific uses, covered by the simplest kind of specifications and identified by the trademarked name TUFFY. Here are some of the steps taken to pre-determine Tuffy toughness that assures longer life:

1. Microstructure Tester. Under powerful magnification, Union Wire metallurgists examine the microstructure of the steel in rods and wires to see that rigid specifications are met and maintained in processing.

2. Static Flexibility Tester. The demand of machinery engineers toward smaller sheaves and higher speed made it necessary for Union Wire Rope Engineers to adapt this standard machine in order to test static flexibility.

3. Rope Testing Machine. This 3-story high machine is designed to test and record the breaking strength of the rope when finished and ready for the customer.

4. Chemical Analysis Laboratory. Steel for Union Wire Rope is made to rigid specifications. Here rods and wires are chemically analyzed to make certain that the correct combinations of carbon, manganese, etc., are kept under control.

5. Wire Tensile & Torsion Tester. In tension and under torsion, this machine tests wires to see that they measure up to the extraordinary high level of strength and toughness mandatory in Union Wire Rope.

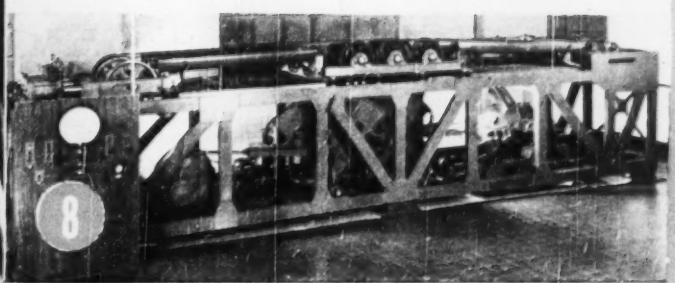
6. Wire Fatigue Testers. The fatigue strength of wire rope is the sum total of the fatigue strength of the wires in its construction. Here, the wires in tension and bending are tested for fatigue strength.

Wire Rope Accelerated Fatigue Tester—Only One of Its Type in Captivity

7. Top view—shows simultaneous testing of three different wire rope constructions. Here, in days, ropes are subjected to punishment equal to weeks or months of hard service.

8. Side view. Designed by Union Wire Rope Engineers, this accelerated fatigue tester is equipped with sheaves from 8" to 24" permitting application of any bending strain. Tensile loads up to 12,000 lbs. are applied. Thus wire rope life under toughest fatigue conditions is pre-determined.

After Union Wire Rope designs pass all of the exhaustive testing imposed by this array of highly specialized laboratory equipment and technical experts, Union Wire Rope engineers submit it to the final test. In the field, under actual working conditions, they confirm the longer life expectancy indicated by laboratory findings and determine proper application which in itself is vitally important.



Tuffy FAMILY SMASH HIT in Construction Industry

Fathered by necessity, conceived in research—the distinguished Tuffy family of wire rope and braided wire fabric constructions have won the popular acclaim of users throughout the construction industry on the dollars and cents basis of better performance. By running your own comparative tests you, too, will be convinced that Tuffy gives you the ultimate low cost wire rope.

Put Tuffy Draglines to any test. Watch them come out on top with unequaled money-saving records. No more complicated specifications. Just the length, size and name Tuffy. That's all.

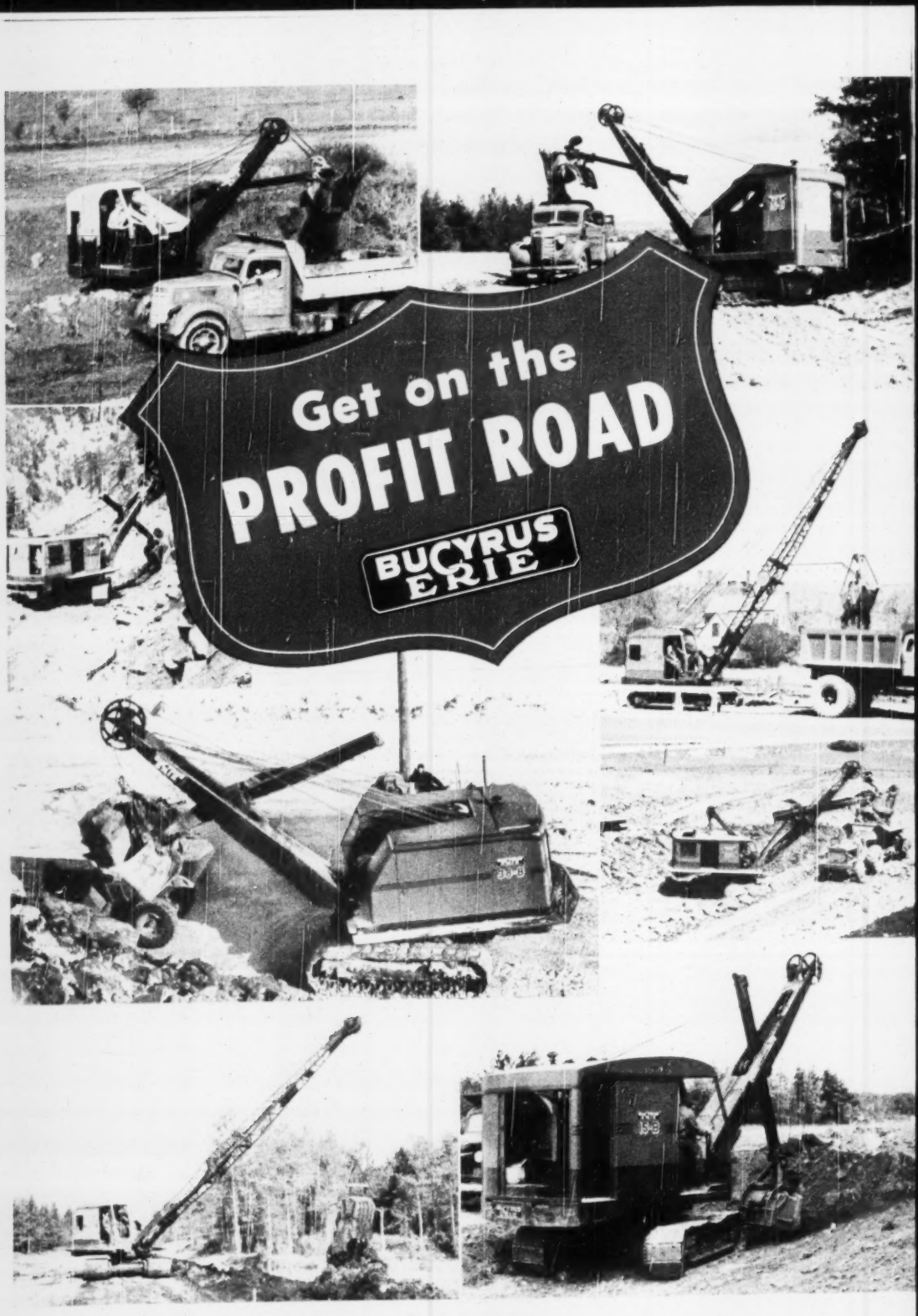
Test Tuffy's ability to handle extra yardage. You will change to Tuffy reels on your whole fleet. The name Tuffy, the diameter and the length—that's how simple it is to buy scraper rope for new yardage records.

An entirely different patented, interlaced wire fabric construction gives Tuffy extraordinary flexibility and stamina. Proof tested to twice working load. Ten types—factory fitted.

Write For
Illustrated Folders
on Tuffy
Draglines . . . Slings
Scraper Rope

union Wire Rope corporation

2228 Manchester Ave. **Kansas City 3, Mo.**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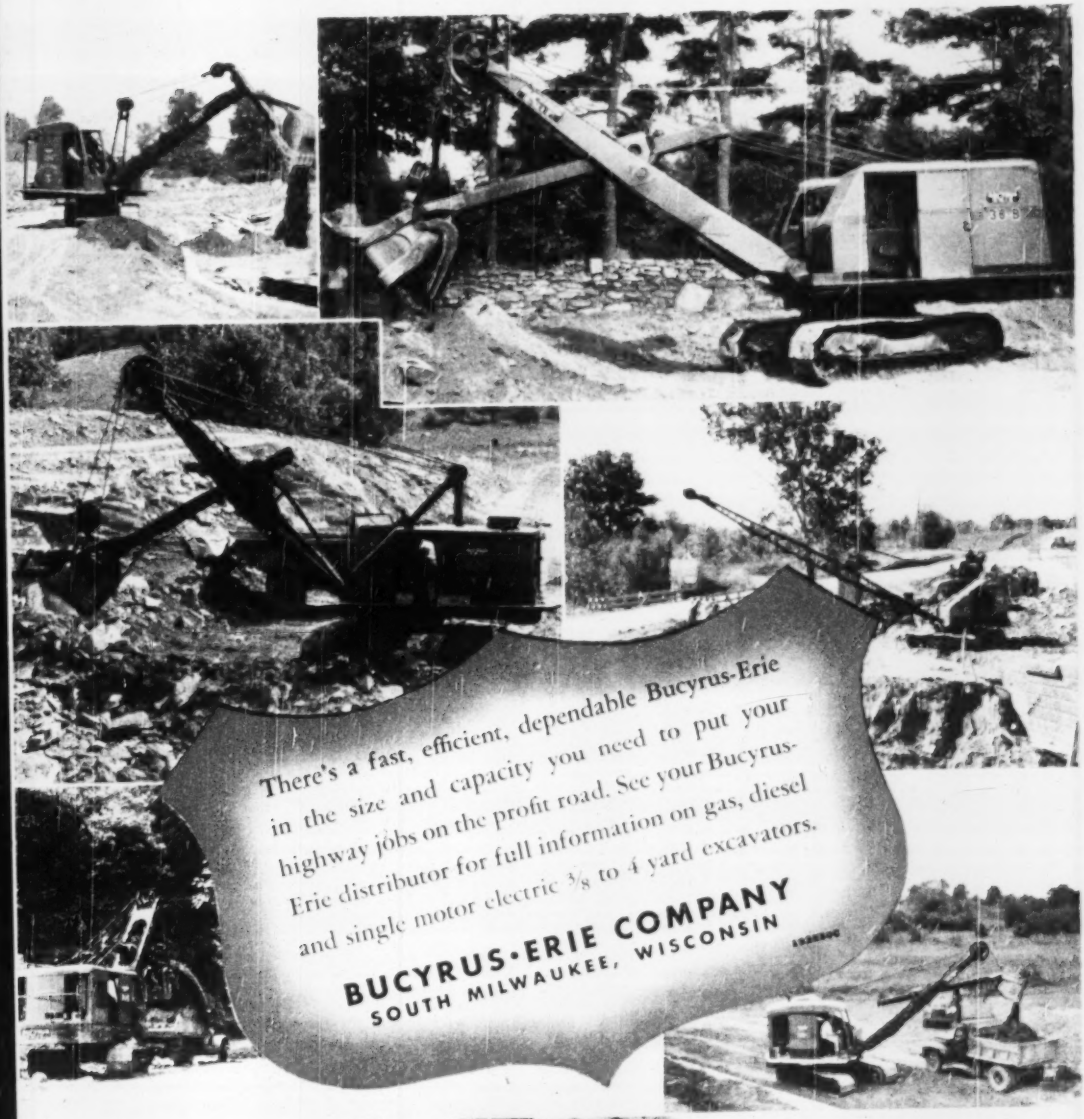
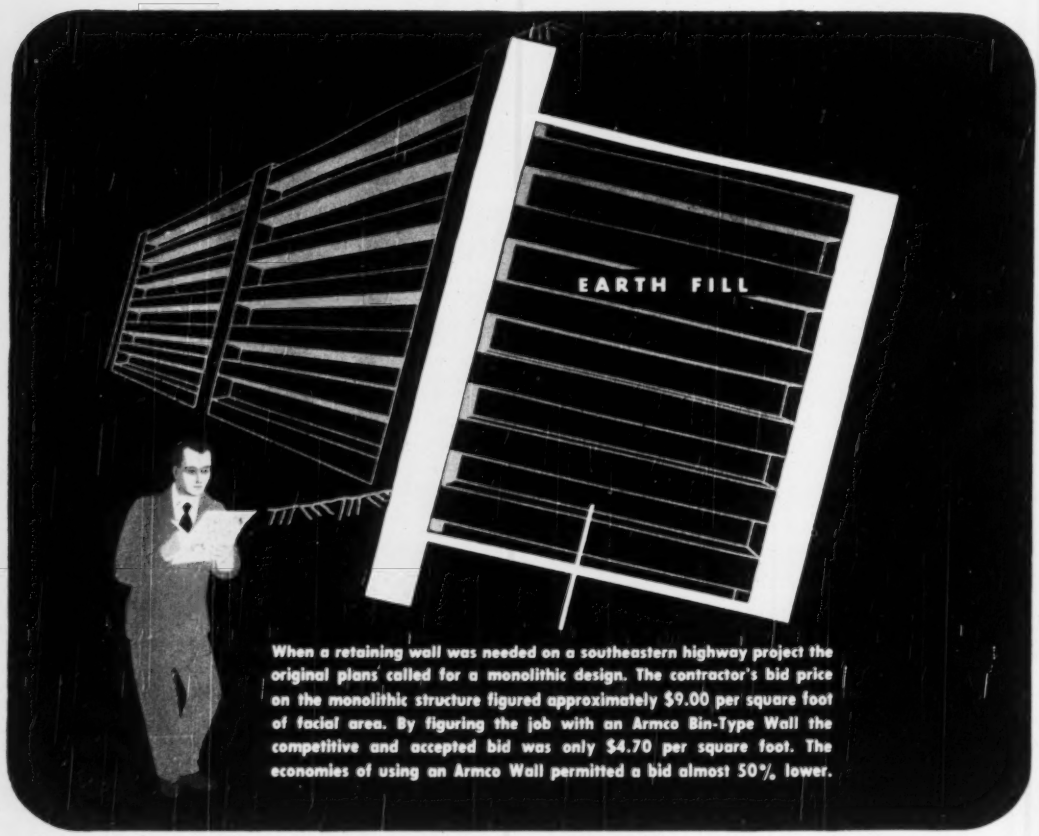


There's a fast, efficient, dependable Bucyrus-Erie in the size and capacity you need to put your highway jobs on the profit road. See your Bucyrus-Erie distributor for full information on gas, diesel and single motor electric 3/8 to 4 yard excavators.

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN



When a retaining wall was needed on a southeastern highway project the original plans called for a monolithic design. The contractor's bid price on the monolithic structure figured approximately $9.00 per square foot of facial area. By figuring the job with an Armco Bin-Type Wall the competitive and accepted bid was only $4.70 per square foot. The economies of using an Armco Wall permitted a bid almost 50% lower.

Contractor Cuts 50% on Retaining Wall Bid

When construction projects call for a retaining wall experienced contractors know a ready answer. They can bid lower and make a good profit with an Armco Bin Type Wall.

Savings start immediately. Less material needs to be transported to the job site and the lightweight metal sections are economical to handle and haul.

Armco Walls are so easy to erect that unskilled labor can do it in any season. Little excavation is the rule. Usually you only excavate for the outline of the bins. Earth in the center doesn't have to be disturbed. Backfilling is done as the job progresses and the hazard of undermining adjacent ground during construction is arrested. There are no forms to build, no delay for curing. The work moves fast and labor costs are low.

Keep profit up and bids low by figuring that next job with an Armco Retaining Wall. You'll also find other Armco products economical to handle and install. These include MULTI PLATE for large drainage structures and corrugated metal pipe for drainage and subdrainage work. Write for data on your specific needs. Armco Drainage & Metal Products, Inc., 4160 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation.

Export: The Armco International Corporation

ARMCO RETAINING WALLS

THE CONSTRUCTION WEEK

DYNAMITE UNDELIVERED—Contained in the explosives that blew up at South Amboy, N. J. last week was 45 tons of dynamite for Morrison-Knudsen's Afghanistan construction operations. According to the rules, however, it was not M-K's dynamite until it was aboard ship. The blowup occurred while the explosive was being barged out. Such dynamite shipments have been made periodically before, but so far as is known, this was the first time that the forwarding company had decided to mix the dynamite with hand-grenades and anti-personnel mines.

SCOLDING—President Truman didn't much like it, but he signed the $1.7 billion (authorization, not cash) Flood Control-Rivers and Harbors bill. Then he took occasion to scold the lawmakers for their piecemeal approach to resources development legislation. Said the President: Other agencies besides the Army Engineers should share responsibility for comprehensive studies such as are set up in the law for the White, Red and Arkansas rivers, and for hydro investigations in New England.

PRACTICE VS. PREACHMENT—Incidentally, Congress bypassed its own declared policy on new projects in the Flood Control-Rivers and Harbors act. Written into the law is a provision that no project be authorized until Congress receives a report from the Chief of Engineers. President Truman pointed out that the act authorizes several projects—total estimated cost about $12,000,000—for which no reports had yet reached Congress.

NEW SANITARY EQUIPMENT—Geiger counters might become standard equipment for sanitary engineers, if plans of Westchester County (N.Y.) are carried out. Engineers plan the injection of harmless radioactive material into sewage effluent. Then they'll use Geiger counters to follow the material and determine whether it reaches bathing beaches along Long Island Sound. William A. Holla, county health commissioner, figures it'll take two years to conduct the experiment—one year to find the right radioactive material, one to follow the particles.

WHO'S BUYING?—Noting "growing tendencies" of manufacturers to cut equipment and materials prices to government agencies, (and with a particular eye on North Carolina) Carolinas Branch AGC members weigh in with strong objections. A resolution approved at Charlotte strongly condemned the practice, pointed out it can hurt the private construction industry. What the contractors had in mind was North Carolina's recent purchase of $5,000,000 worth of road machinery, and an additional purchase (May 17) of $150,000 more. Contractors say that some manufacturers are cutting their prices as much as 30 percent to governmental agencies.

BOCA HAS CODE—After nearly five years of struggle, the Building Officials Conference of America will bring out the first of its two model building codes as a major feature of a four-day annual meeting at Indianapolis, June 5-8. First will be BOCA's Abridged Building Code—designed specifically for the use of smaller communities. The Basic Code—a much more voluminous matter—is expected to be printed and ready for distribution about mid-July. Publication was financed by the Building Officials Foundation.

LOCAL FIGHT—It hasn't yet made much of a dent in the overall program, but the National Association of Real Estate Boards is having some success in its fight on public housing. The strategy is simple enough: (1) Take it over the head of the city council to the voters; (2) Do it where most of the voters are property owners, who can be impressed with the tax burden of public housing. Following these tactics (though there's no general pattern—each battle being fought on local lines) NAREB has counted a number of victories—notably Seattle, Racine, Wis., Grand Rapids, Mich., Portland, Ore., Lincoln, Neb., St. Petersburg, Fla. It doesn't work too well in the really big centers—New York, Chicago, Los Angeles, Boston, Omaha, among them. And, to date, Public Housing Administration has granted 550 applications to local housing authorities, totaling 293,000 housing units. (see p 24).

FLEMING HEADS TRANSPORTATION—President Truman persuaded Maj. Gen. Philip B. Fleming to take the new "reorganization" post of Under-secretary of Commerce for Transportation. Senate confirmation is regarded as routine for the general, who has won many friends and made few enemies during his tenure as FWA administrator and later as Maritime Commission chairman. In his new job, he takes Public Roads back under his wing, much to his own satisfaction and that of BPR. He retains administrative supervision over the new Maritime Board and Maritime Administration—replacing the old Maritime Commission—and adds to his responsibilities two other transportation agencies of the Commerce Department—the Civil Aeronautics Administration and the Inland Waterways Corp.

KNOW ABOUT *NEW* "FLEETWELD 72" for high speed production welding?

• **Welds Faster.** Operates efficiently over a wider current range than conventional E-6012 electrodes. Operates best at currents substantially above conventional E-6012 rods . . . and without overheating.

• **Welds Easier.** Unique arc characteristics assure proper root penetration on fillet welds without sacrificing speed . . . minimizes the danger of cutting away the top edge on lap welds (Fig. 2).

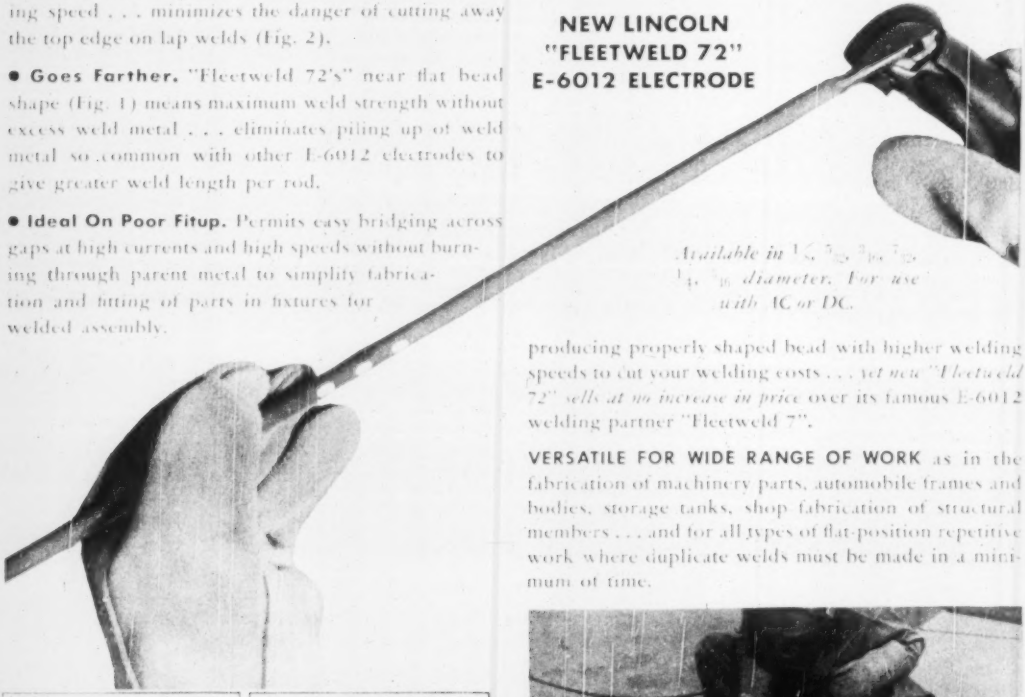
• **Goes Farther.** "Fleetweld 72's" near flat bead shape (Fig. 1) means maximum weld strength without excess weld metal . . . eliminates piling up of weld metal so common with other E-6012 electrodes to give greater weld length per rod.

• **Ideal On Poor Fitup.** Permits easy bridging across gaps at high currents and high speeds without burning through parent metal to simplify fabrication and fitting of parts in fixtures for welded assembly.

• **Needs Less Cleaning.** Smooth, uniform operation over broader current range minimizes spatter . . . On many types of work, slag is practically self-cleaning.

• **Premium Performance At No Extra Cost.** New "Fleetweld 72" combines the benefits of greater ease in producing properly shaped bead with higher welding speeds to cut your welding costs . . . *yet new "Fleetweld 72" sells at no increase in price* over its famous E-6012 welding partner "Fleetweld 7".

NEW LINCOLN "FLEETWELD 72" E-6012 ELECTRODE



Available in $\frac{1}{16}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$, $\frac{5}{16}$ *diameter. For use with AC or DC.*

VERSATILE FOR WIDE RANGE OF WORK as in the fabrication of machinery parts, automobile frames and bodies, storage tanks, shop fabrication of structural members . . . and for all types of flat-position repetitive work where duplicate welds must be made in a minimum of time.

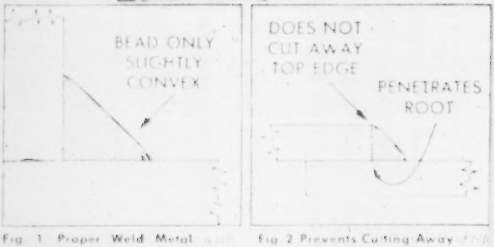
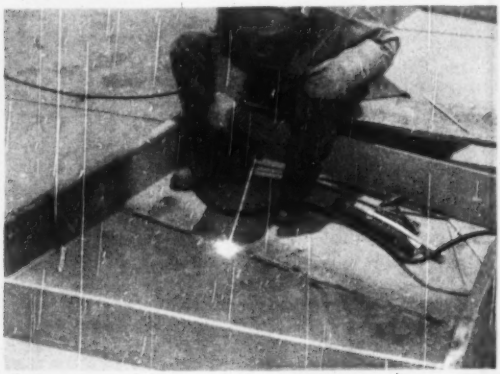


Fig. 1. Proper Weld Metal with "Fleetweld 72" near flat bead means greater strength from each electrode.

Fig. 2 Prevents Cutting Away of top edge on lap welds . . . weld flows out to produce full throat . . . penetrates root. Prevents piling up of weld metal.



GET THE FACTS

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LINCOLN

CONSTRUCTION TRENDS

INDUSTRY INVESTMENT PLANS

	1949 Expenditures	1950 Original Plans	1950 Revised Plans
	(millions of dollars)		
Manufacturing	7,[illegible]0	6,300	6,845
Chemicals	1,[illegible]0	1,040	1,100
Petroleum refining	7[illegible]0	580	580
Food	600	585	625
Machinery	530	460	475
Steel	520	445	490
Autos	420	550	740
Textiles	410	360	390
Electrical machinery	200	135	145
Transportation equipment	145	95	100
Other manufacturing	2,575	2,050	2,200
Railroads	1,310	735	970
Electric & Gas Utilities	3,160	3,050	3,000
Other transportation and communication	1,880	1,695	1,775
Mining	750	620	650
Grand total	14,300	12,400	13,240

BUSINESS EXPANDS ITS 1950 PLANS FOR NEW PLANTS AND EQUIPMENT

An upturn in industrial building seems here.

ENR's contract awards on industrial building, while lagging behind the boom in most other types of building, are running 10% ahead of last year.

Now, a recheck of McGraw-Hill's annual survey on "Business Plans for New Plants and Equipment" indicates that the year-and-one-half-old downtrend in business investment is being reversed.

The check was made among leading manufacturing, mining, transportation, and utility companies; it shows that industry now plans to invest 3% more in the last half of 1950 than it did in the first six months. The gain is small. But it is the first upturn in plans for capital expenditures since late 1948.

PLANS 7% BELOW 1949

Capital expenditures in 1950, as planned now, will still be lower than in 1949 by 7%. However, at the start of the year, plans were 13% under the 1949 level. Among major industries, only petroleum and the utilities have not revised their plans upward. The table shows how plans stand now.

The second half of the year will see higher capital expenditures than did the first half in most manufacturing industries. The auto industry shows the biggest increase—it plans to spend 64% more in the next six months than it is spending in the first half. New plants—for automatic transmissions—are a key factor.

Other manufacturing industries plan to spend from 4% to 8% more for new plants and equipment, except for the electrical transportation equipment, and electrical machinery industries. They are holding expenditures level or dropping them slightly.

Railroads and mining companies will hold their plant and equipment purchases level through the year. Electric and gas utilities, however, are planning to spend 2% less in the second half than in the first. The decline here can be traced largely to a slowdown in electric utilities' construction programs.

STRENGTHENS BUSINESS OUTLOOK

The upturn in industry's investment plans adds strength to the business outlook. At the start of the year, business forecasters had strong doubts about the period after Labor Day, but now business promises to run on at a high level through the year.

Combined with the boom in other kinds of construction, high-level plant and equipment expenditures underwrite general prosperity. The sharp surge in the number of houses started this spring, plus the high level of contracts awarded for heavy construction means that activity in the field will hold at a high level—even if starts and contract awards begin to taper off. Since construction and capital equipment together account for a major part of industrial employment, that helps importantly to hold employment up. And high employment, in turn, promises good general business.

This spring, in fact, is seeing business set many new records aside from those in construction. The steel industry, almost week by week, has upped ingot tonnage from one new peak to another. And still manufacturers complain that steel was harder to get, for some of them, than it had been in wartime.

A fabulous production pace was set by the auto industry in the weeks after Chrysler employees went back to work. Production hit an annual rate of better than nine million cars and trucks. In addition, the industry expects to keep going at a high level at least until model-changeover time in the fall. The widely hailed five-year General Motors agreement means there will be no major break in the rhythm of the assembly lines.

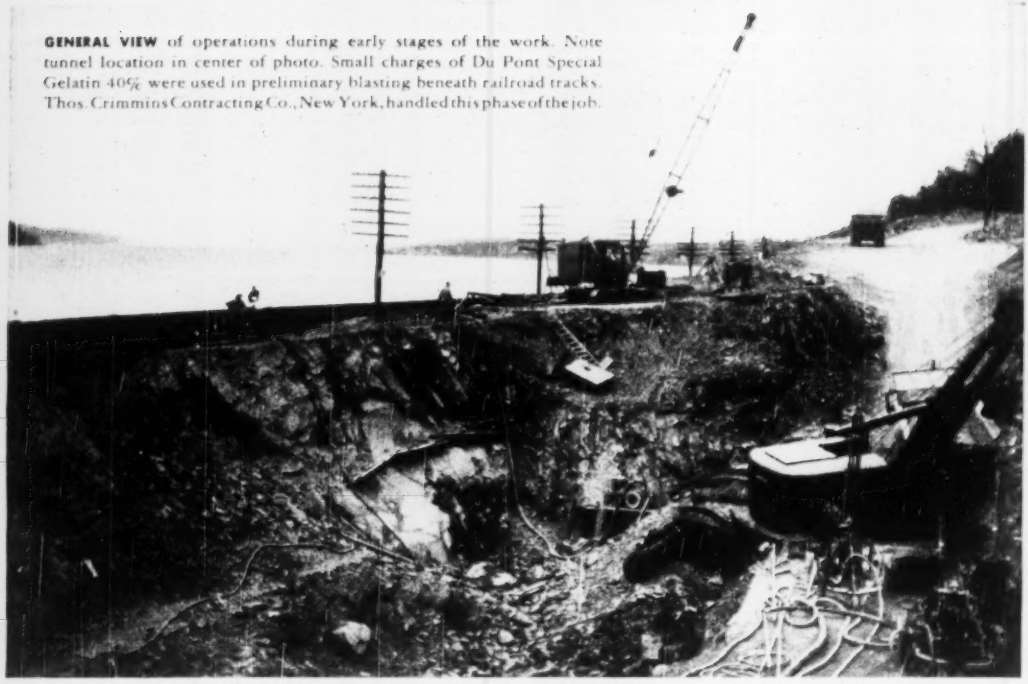
Other lines, notably in home appliances, set new production and sales (production and sales records this spring. Refrigerator and vacuum cleaner manufacturers, for example, topped their past records. Television makers, even though sales showed down late in May, have raised their sights for the year.

The U. S.'s gross national product in the second quarter was running very close to its past highs.

Value of all goods and services produced in the country was estimated at nearly $270 billion—a point reached only once before, in late 1948. But since prices of almost all products have come down markedly since then, the actual physical volume of output was probably at its all-time peak.

In short, both construction and general business go into the summer at a very high level and with prospects bright for the rest of the year.

GENERAL VIEW of operations during early stages of the work. Note tunnel location in center of photo. Small charges of Du Pont Special Gelatin 40% were used in preliminary blasting beneath railroad tracks. Thos. Crimmins Contracting Co., New York, handled this phase of the job.



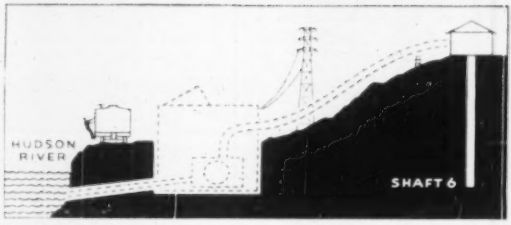
N.Y. "taps" the Hudson

ANOTHER JOB FOR DU PONT DYNAMITES

Contractors chose dependable Du Pont Special Gelatin 40% for all land blasting operations in constructing an intake tunnel, chlorination plant, pump house and 700-foot pipe line—major sections of a $5,000,000.00 N. Y. Board of Water Supply Project now under way at Chelsea, N. Y., where the Hudson River is being tapped to augment metropolitan New York's water supply.

Hard limestone, capped by a layer of varying thicknesses of shale, proved no obstacle for this versatile, widely used dynamite. Charges of just moderate size because of proximity of busy railroad tracks readily broke up the rock for easy removal by truck in driving the tunnel and excavating for building foundations. Du Pont Electric Blasting Caps also are used exclusively.

Whatever your job of construction . . . , if large or small, "run of mill" or difficult blasting is required, there are Du Pont explosives and blasting supplies especially suitable for the work. Ask the Du Pont explosives representative in your area for complete information and recommendations. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.



DIAGRAMMATIC SKETCH of proposed 120-foot intake tunnel of 8-foot diameter, chlorination plant, pump house and upgrade pipe line to 680-foot Shaft 6 of existing Delaware Aqueduct Water System into which water from Hudson will be delivered. The Fuller Construction Co. and A. J. Dillenbeck, Red Bank, N. J., are general contractors.

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

DU PONT

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Consultants Are Necessary

EVERY SO OFTEN one hears that the profession of consulting engineering is on its last legs. Even consultants themselves have been known to voice such beliefs after seeing some important commission taken over by the staff of some public agency. Such despondency, however, is not justified, and both the record and a demonstrable need for the services of consulting engineers can be cited to prove it.

It is true that the nature of consulting service has changed in some particulars over the years. Principally this may be noted in the fact that there are fewer straight designing jobs today than formerly. The bulk of the road and dam designing, for example, is now done by governmental agencies. But it is also true that the need for and the use of consultants as specialists has in nowise diminished. Indeed, new fields have opened up, such as that of soil mechanics, and a re-entry of the consultant into the highway field has accompanied the new interest in toll roads. The great New Jersey Turnpike is almost wholly a consulting engineer operation.

New York City last week afforded a prime example of the reliance that modern engineering practice places on the consultant and of the essential service that he can perform. New York's various engineering departments are big and competent enough, it may be the world over, to plan and design engineering work. But New York, historically, has relied upon consultants for guidance on important engineering decisions. The reason is clear, and points up the basic justification of the consultant. City departments, and governmental agencies, cannot afford to keep specialists on their staffs for only occasional use. Even if they could, the specialists are not in a position to keep up with advances in their specialties. Even if they were, their judgment would benefit from an unbiased outside opinion.

Faced with fundamental and far reaching decisions regarding water supply, New York went to private consulting specialists for advice. Befitting the magnitude of the problem they hired not only one but five top-ranking specialists to confer and study various alternatives jointly. New York is thus assured of unbiased, authoritative advice based on years of experience with every conceivable type of water supply problem in this country and elsewhere. In no other way than through the services of expert consultants could this assistance be had.

The day of the consulting engineer is not over. It is not even threatened. Keen specialists, kept keen by constant activity in their specialties, are a bulwark against decadent technology and mistaken economies in civil engineering. No doubts on this score should be entertained—in engineering schools, in engineering departments of government or business and, least of all, in the minds of the consultants themselves.

Keeping Contracts Out of Court

A COMMON CLAUSE in construction contracts is one stating that when disputes arise over requirements of the contract they shall be decided by the architect or engineer, and his finding shall be final. Such a clause has much to commend it. Someone must decide such questions without needless bickering or delay, and the architect or engineer is better qualified to make the decision than is the owner. But the powers thus granted to the engineer or architect are limited, despite the broad wording. If the engineer's finding is unfair to the contractor, is apparently in error, or relates to a provision of the contract that is not clear, the contractor can take it to court for judicial review.

That is such a long established rule of law that it is difficult to understand why some engineers still seek to find ways to get around it. In one contract that found its way into court recently the engineer had added a clause stating that in order to avoid delays each party to the contract waived his right to court review of disputed questions. But the court declared the clause to be void just the same. The contractor could not be so easily deprived of his fundamental rights even though he had signed the contract containing the waiver.

Engineers are commonly considered as occupying an impartial position between the owner and the contractor. Actually, however, the engineer is not a disinterested party. Usually he writes the contract and so has an interest in seeing that it is not construed in such a way as to add to the cost of the work. Hence his interpretation of its provisions could be quite different from those of the contractor or of a court of law. That is why courts have consistently refused to approve of contract clauses that attempt to deprive the contractor of his right to an independent review of the engineer's findings, either by a court or an arbitrator.

There is only one way in which court review of the provisions of a contract can be avoided. That is by having both parties agree to refer all disputed questions to an arbitrator whose finding shall be binding. Rulings made by such an arbitrator, the Supreme Court has stated in a recent decision, cannot be set aside by a court. If engineers or architects want to avoid the delays that usually occur when their findings are taken to court, the proper way to attain that end is through agreement on an outside party as arbitrator. Attempts to find wording for the contract that will put their own decisions beyond court review are doomed to failure.

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MAKE MONEY by saving it! These pictures tell the story - how back-breaking work is eliminated and Racks kept clearer of leaves and other debris, by the use of this simple device which automatically assures higher turbine or pump performance. Write for Bulletin 116 - now!

If It's Hydraulics - Put It Up to Us!

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YORK, PENNA. U.S.A.

ENGINEERING NEWS-RECORD

JUNE 1, 1950 VOL. 144 NO. 22

Material shortages appear as building boom continues

Lumber leads list of supplies hard to get, but steel, lath, block also reported scarce in spotty market—Heavy demands, strikes, open winter seen as causes

ENR Staff Report

A rapid build-up of shortages in one major building material—lumber—coupled with increasing reports of tightening supplies of steel, metal lath and pipe, began to appear last week to cloud an otherwise bright construction sky.

The lumber shortage is nationwide and already has pushed prices well above previous levels. Fir, for example, now averages $101 per M bdft in 15 centers—9% above a month ago, 25% above Jan. 1. Pine Lx 6's, for example, now average $87 per M bdft in 10 cities—12% above the price of a month ago.

But mounting reports of other materials shortages—most of them prime components for the booming housing market—caused U.S. government experts to be struck on predictions they made only a month ago that all was comparatively well in the construction supply field. Today, the experts aren't too sure. Time enough with the exception of lumber—the shortages are spotty and not in the same materials everywhere. But prices are going up on many items, as materials begin to tighten.

The shortages and the rising prices are already a cause of concern to many builders. A week ago the National Association of Home Builders, at Washington, advised its members to buy their materials now before there is further price increase.

• **Here's why**—Reasons for the change aren't hard to find. Biggest one is the booming home construction market (see also p 24), which has established one new record after another in the first four months of 1950, and promises to keep up the pace. It has grabbed up materials largely limited in steel, lath and concrete block at an astonishingly fast rate.

Then, too, construction generally has been moving at a fast pace, with highway work, heavy factory and plant buildings, bridges, sewage treatment works all moving at record rates.

Finally, a prolonged strike against the huge Weyerhaeuser Timber Co., which produces some 10 percent of the U.S. Douglas fir supply and a large share of other lumber products, has been a heavy contributor.

Fourth, an unusually open winter in the East kept building—and demands—in high gear.

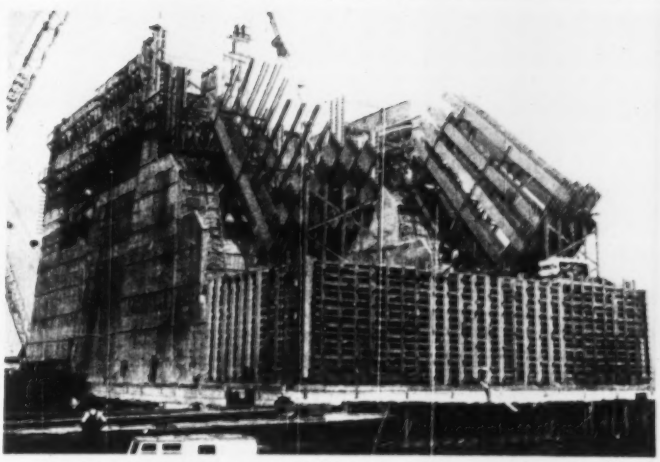
• **Prediction**—A month ago, surveys of manufacturers of building supplies indicated no particular forecast shortages. Producers of gypsum board, nails, roofing and siding, plumbing supplies, hardware and cement felt that, barring major dislocations, there would be no major shortages of materials.

But a month ago exactly, economists on the ENR staff pinned a flag on the possibility of shortages (ENR April 27, p 19) with the statement that with the generally booming condition of the industry, supplies would shortly begin to put a ceiling on rate of construction and that the squeeze would be on housing mostly.

To check its own reports, ENR last week asked its specialist reporters in 20 U.S. cities to look into the supply situation. Their reports confirmed all points except one: no serious shortage of labor seems in prospect.

• **Details**—In detail, the reporters indicated only one general shortage—lumber, both pine and fir. Four of the cities reported tightening in supplies of steel, mostly structural shapes; five reported metal lath was difficult to obtain; cinder or concrete block in both were short in three cities, and scattered shortages of other materials—including brick (at St. Louis), steel and vitrified sewer pipe (in Philadelphia and Cleveland), and cement (in Baltimore and Dallas) were also reported.

Without comment, producers in the east and in the west coast declared that shortages—mostly in Texas points—were artificial rather than because of lack of supply. Actually although normal production backlogs usually built up in slower winter months weren't brought up to quite the normal over the producers say there isn't any cement shortage. Difficulty is largely traceable, say producers, to the disruption of the industry's pricing practices (including freight-cost absorption) that were caused by recent court decisions.



ANCHOR TO EASTWARD—Steel eye-bars are being erected in the east anchorage pier of the Delaware Memorial Bridge, near Wilmington. Each of the two groups will hold the 19 strands (each made up of 456 steel wires 5 in. dia) of which each 20-in. dia suspension cable will be composed. See also p 27.

No starts yet in federal-aid housing; prospects for 1950: perhaps 40,000

Public Housing Administration ready to sign contracts with 10 local authorities—Contracts may be advertised thereafter

Federal-aid public housing is the failure of an otherwise booming construction year.

Six months ago, Public Housing Administration reiterated its belief that 115,000 units would be started during 1950 under the 1949 Housing Act. (ENR Nov. 17, p. 29). Three months ago it halved its prediction.

With five months gone, PHA has no units under contract, even though it had assured the House Appropriations Committee that 20,000 would be started by Jan. March 31 and 50,000 by June 30.

By mid-May, PHA was ready to sign definitive loan contracts with 10 local authorities for 4,450 units. Such contracts must be signed before authorities can advertise for bids. Bids would be received by local officials. PHA Administrator Dan T. Egan hopes to get 12,000 to 15,000 units under construction during the third quarter. PHA has no fourth quarter goal, but expects that even more units will be started then. Agreements with local authorities and the contracts for the first 10 units could be signed before the end of June.

- **Housing boom anyway.** It was not the failure of the federal program to stimulate home building that has been responsible for the drop in private housing starts in the second month through April.

PHA, however, is still pushing. Home agreed to August that the immediate goal is 40,000 units by Jan. 1. But PHA officials admit that even this goal will be hard to reach.

Waiting for the first contracts to be signed are 37 projects which received preliminary loan commitments under the National Housing Act amendments that set up local housing authorities to sign annual contributions contracts with city councils. These agreements covering low-rent units, usually to be tax-exempt, provide subsidies of two types: annual grants.

Next step back is the preliminary loan contract which makes PHA advances funds for planning, investigation and the like. Preliminary loans have been signed for 337 such contracts, totaling $45,000,000 covering 74,000 units. These 337 cases were put at the head of the line for definitive loan contracts.

- **Private builders fighting.** Most of these projects would be somewhat higher than they are if private home builders had not fought their opponents in public housing. (See ENR July 7, 1949, p. 60). While the anti-public housers have stopped much public housing, they have not stopped the 7 per cent but they have been successful in cases but one, when they stepped in to get a program on a piecemeal basis. Their one defeat at the polls was in Wilmington, Del. Their latest victory, Portland, Ore., which had voted three times for public housing and lost each time, appealed to the Oregon Republicans. Young Democrats, Americans for Democratic Action, the American Legion, VFW, Veterans Committee and, of course, AFL and CIO unions, spoke.

Private builders' argument is the principal argument against public housing from the homeowners. The argument, that is, that public housing is unfair competition to private enterprise, has been used by builders and local real estate boards to defeat the bill, to defeat the public housing bond issue, to exempt public housing from taxation, to amend the law and to defeat appropriations for it.

- **Future home volume insured.** With so much work in progress, PHA officials are confident that the federal housing program will get started. Even though the existence of the program may have the effect of postponing some home building, it is not likely that such homes will be built the next year or two if there is a serious slump in business. Private builders would be quick to step back into the picture.

The public housing program has helped push home building prices up even more than they have risen from increased costs.

Sewer rental charge sought in New York

O'Dwyer asks levy to finance big disposal program—Strong opposition indicated by councilmen

Scratching desperately for means of financing its huge sewage disposal program, New York City's Board of Estimate will approve a city-wide rental charge to property owners.

No formal bill to realize the charge has yet been submitted to the city council, which must approve such a measure. Several councilmen indicated last week that the charge would meet stiff opposition when it comes before them.

The city now has under way a $365,000,000 program for construction of new sewage treatment and disposal works, as the first of a concerted drive to clear the waters of New York Harbor and improve the quality of water at municipal bathing beaches near the city.

Mayor William O'Dwyer, whose administration has been beset by fiscal difficulties through budget and capital appropriations, recently said that the sewage rental charge would bring in $27,000,000 a year. He proposed that in Brooklyn, which is completely sewered, the charge would be 10 per cent of the water rental. In Manhattan, the Bronx, Queens and Richmond, which have only partial sewer systems, the charge would be 5 per cent.

Assuming full acceptance by the council of O'Dwyer's proposal, the charge would be roughly one third of 1 per cent of present water bills and would be added to the water bills for payment. He estimated that the rate would result in an added charge of about 40 cents per month per residence, and would produce revenue for the city's sewage disposal system.

The point around which controversy over the charge will center is whether it can be considered by the courts to be a tax, and therefore subject to the limitations on tax rates. Comptroller Lazarus Joseph has argued that 75 per cent of the money for the sewage disposal program would be the equivalent of the property taxes that would be exempted from the debt limit if the city, with the same amount of bonded debt, had a private sewage disposal system.

The entire charge was opposed by Councilman Abe Stark, Democratic floor leader, who said that the city should not be forced to pay for a program for the city's entire population from charges levied only on property owners.

Such rental charges have been under consideration by the Board of Estimate since the state legislature authorized them three years ago. O'Dwyer told the press that he now expects the board to approve the proposal within three weeks, so that the sewer rental charges may be applied beginning July 1.

Maine Turnpike shows profit, good prospects

Two-year balance sheet shows earned surplus, substantial revenue gains—Fare and volume increases helped

Maine's Turnpike is nicely in the black and its business is improving at a startling rate.

That's the message conveyed by a balance sheet covering its first two years of operation—1948 and 1949—and the first third of 1950. The figures were given ENGINEERING NEWS-RECORD by W. B. Getchell, Jr., executive director of the Maine Turnpike Authority.

The balance sheet shows that opponents of toll roads, who had been using the Maine superhighway as an example of the fallacies of this type of highway, were right at one time in their charges that the road ran a deficit. It did in 1948—even though it was not a deficit which imperiled bond holders. They were covered in any event since the revenue bond issue which provided construction funds included an item for interest during the first year of operation. Net revenues during 1948—the road was opened in December, 1947—totalled $449,207, which fell short by $63,203 of covering first year interest.

That deficit, though, was wiped out last year and an earned surplus established. This came about through net revenues of $642,805, a gain of about 43% over those for 1949 and in excess of debt service obligations by $113,505, or almost twice the 1948 deficit. It took an increase in fares to make this 1949 showing, however, along with increased traffic and greater revenue per mile.

• Boom year—1950. The first four months this year showed a 49% increase over the comparable period of 1949 in receipts and 61% over the comparable period of 1948. Traffic was up only 6%, indicating the effect of the fare increase which was in effect during the comparable period of 1949. With summer traffic estimated at three times that of winter months, the expectation is that 1950 will show net earnings in excess of those in 1949.

One of the things which helped the authority to better its 1949 record in 1949 was its ability to keep operating expenses to a small fraction of the increase in revenue. During the authority's $220,485, excluding debt service, to operate the road in 1948, when the gross was $677,475. In 1949, when the gross had doubled to $887,858, it cost the authority $228,840 to operate the road. Including debt service interest of $16,500 in 1948 and $220,000 the increase in gross was eight times the increase in expenses.

Largest increases in operating expenses were in administration, which rose from $32,761 in 1948 to $41,343 in 1949, and in fare collection, which went from $91,105 in 1948 to $102,174 in 1949. There was a tiny increase in the cost of roadway and structure maintenance, and cost decreases in accounting, garages, shops and equipment, the latter down 53%.

SPEEDS WASHINGTON TRAFFIC—One of Washington's most needed improvements, the new $6,000,000 highway bridge between the District of Columbia and Virginia, adds four traffic lines at a major bottleneck. The Pentagon is at upper right. (Wide World Photo)

No second Bay Bridge

Engineering work for a second San Francisco Bay Bridge is being abandoned (ENR Apr. 27, p. 17). California turns to the decision to Congress, failing to grant a right of way across Yerba Buena Island. But Washington won't legislate on local matters if there is any community on what is wanted, and California Congressmen disagree on type of crossing.

Thus, the State Public Works Department is defunding an engineering organization of about 70, which had been expected to grow into a second Bay Bridge construction group.

On July 1, much of it will be assigned to preliminary engineering on a proposed highway bridge across the south arm of the bay between Richmond and San Rafael. The legislature has appropriated $2 million for this work, following a preliminary study and report by Luhr & Wright, San Francisco consultants. Estimated cost of the crossing is $56 million.

Salt Lake pollution creates health hazard

Consulting engineers to be called in on problems arising from sewerage disposal in bay city and county

Salt Lake City, Utah, and Salt Lake County officials will call in consulting engineers to discuss an increasingly critical sewage disposal problem. City and county sewage at present passes from trunk line sewers on the west side of the city into open ditches and flows into a bay of the Great Salt Lake. The city alone dumps 35 mgd of raw sewage into the lake, and county communities and towns in Davis County reportedly contribute another 15 mgd. For many years it had been believed that the high salt content of the lake effectively disposed of the bacteria content, a theory that has now been largely disproved.

A great body of filth has been discovered recently near the outfall sewers and city health authorities, led by Dr. James A. Davis, health commissioner, are alarmed about the situation. Public bathing beaches are in heavy use each summer a dozen miles from the "sewage bay," separated from the lake proper by Antelope Island, which has been a peninsula rather than an island during the past decade because of the low level of water in the lake.

However, with heavy snowfall the past three years, the lake level has risen to a point that is again cutting Antelope Island off from the mainland. Health Commissioner Davis said that another rise in the water level "will be critical."

"Even now high winds are blowing the sewage over the natural protection bar which has recently kept the island connected with the mainland." Dr. Davis expressed belief that dikes might be erected as a temporary but expensive measure to help prevent sewage from flowing into the lake proper.

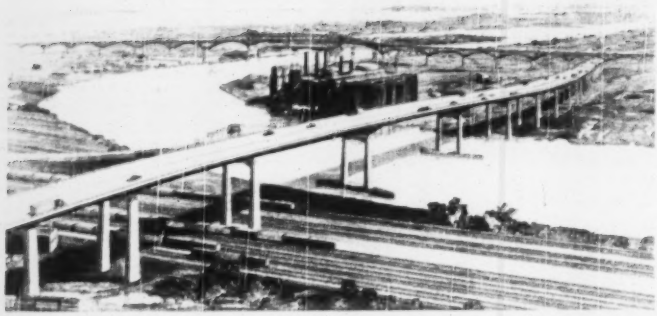
Helicopters to be used in B.C. coastal survey

Surveyors for the British Columbia government will make full use of helicopters this summer in mapping an accessible area of the coastal range.

The Geodetic Survey Branch plans to use a machine to cover a large district east of Portland Canal in northern B. C. this year.

Conventional methods will be applied between Stewart and Mezadin Lake and crews will move to difficult locations by helicopter.

Helicopters were used last season but primarily the present scheme is more extensive and covers a larger area.



RECORD-BREAKING BRIDGE—This bridge will carry New Jersey's Turnpike across the Passaic River in Newark and Kearney. Chairman Paul Troast, of the Turnpike Commission, says its river span of approximately 375 ft. will be the longest on record in the country for this plate-girder type of bridge. The overall length will be almost 7,000 ft. Drawing shows the Pulaski Skyway in the background.

No proof U.S. stream flow declines

Rainfall and overall records going back a century or more indicate no consistent downward or upward trends in the water supply of the United States. These long-term records though few in number suggest that the present phase of diminished precipitation probably is temporary, according to an appraisal by Joseph A. Ball and Conrad D. Bue, of the U. S. Geological Survey.

Their conclusions were given to the American Meteorological Society, assembled in Washington, D. C., on the part of the thirty-first annual meeting of the American Geophysical Union.

On water supply the USGS men discounted the cyclic concept of belief that dry spells generally tend to be long. Only for some areas, they said, do streamflow records show a downward trend or cyclical pattern during the last 50 to 60 years. Studies so far have failed to indicate any significant relationship between the reduction of forest cover and the reduction of stream flow.

From studies of available records, including those that go back much farther than the 50 or 60 years, the two USGS men concluded that a long-term increase or decrease in precipitation is not indicated for the country as a whole. Rather, they indicated, an extreme condition to be reckoned with is the occurrence of a short-term drought.

• **Utah studies reported.** Effects of water spread on irrigated farmlands and losses caused by evaporation from reservoirs and canals were studied by Wayne D. Mitchell and Harold Peterson, of the Utah Agricultural Experiment Station, reported Dr. A. Rassell Grant, of the U. S. Bureau of Reclamation.

During the June 1-Sept. 15 growing season, total evapotranspiration averaged about 15, 13 and 11 in. respectively for the region, high-cover and bare sites. The evapotranspiration deficit, the difference between moisture content at field capacity and that at the end of the growing season averaged about 12, 9 and 4 in. for the three sites, measured in 6-ft. deep soil profiles. These deficits represent the amount of water that must be replaced before water can pass through the soil to recharge underground storage.

Summer rain averaging 7 in. caused no increase in the depth of deficiency, but caused an average reduction of about 3 in. in the amount of water that must be replaced before water can pass through the soil to recharge underground storage.

• **New measuring method.** Daily rates of evaporation can be determined by a new theoretical treatment, Alfred C. Reichelt, of the Weed Heights Observatory, Incorporated told the geophysical union. Application of rates of evaporation in the field at any given time depends upon knowing the relationship between the water vapor pressure at the surface of the ground and the pressure of the water vapor in the air above it.

Daily rate of evaporation is modified by dumping of the vapor pressure and wind velocity, which in turn is affected by the degree of instability of the air. Reichelt described the diagnostic method and the physical principles upon which the method is based. He said that data on the water losses during a period of 24 hours can be obtained from measurements of the vapor pressure and wind velocity at two levels above the ground.

With damping coefficients such as apply to typical coastal bays, the augmentation of the tidal range will not be greater than fourfold. In the Bay of Fundy, the conditions for resonance are not unusual, Redfield said. The exceptional range in tide there is due to the great range in tide in the Gulf of Maine, combined with optimum amplification conditions in the bay.

Walter H. Bucher, professor of structural geology, Columbia University, was reelected president of the American Geophysical Union for 1950. Elected vice president and general secretary, respectively, were Francis W. Reichelderfer, chief of the U. S. Weather Bureau, and K. Hilding Ter, assistant chief, Hydraulics Laboratory, National Bureau of Standards.

Six provinces agree on Trans-Canada road

Six of the ten provinces of Canada have signed agreements with the dominion government for the joint financing of a special Trans-Canada Highway within their boundaries (ENR Dec. 22, 1949, p. 27). The joint financing will thus be limited to Ontario, Manitoba, Saskatchewan, Alberta, British Columbia, and Prince Edward Island.

Small technical difficulties alone now prevent the other three Maritime Provinces from signing.

The province of Quebec, however, has not yet given any evidence of its approval.

Costs as estimated by the six signatories amount to $220 million, with an additional $50,000,000 known to be necessary for the gold mines Newfoundland. It therefore appears that the total cost of $300 million originally estimated to be shared equally by dominion and provincial governments will be considerably exceeded when all provinces enter.

The highway will start at the western end at Vancouver and by way of Chilliwack and Kamloops go through the Rocking Horse Pass in the Rocky Mountains to Banff and Calgary. From there it will turn northeastward to Medicine Hat across the prairies in a straight line via Regina to Winnipeg and then across Ontario through Kenora to Kenora in the Lake of the Woods area, from Kenora to Port Arthur-Fort William at the head of Lake Superior, and then by a new road to Nipigon, Schreiber and Chapleau to Sudbury, a major junction. From Sudbury via Parry Sound, through Muskoka Lakes country to Peterborough, then through Toronto, east now to Ottawa and Montreal. The route through Quebec might not be used immediately.

No property right in pollution, AWWA told; eminent domain not required

Annual meeting of water works group hears exposition of board powers held by states for pollution abatement action

John C. Bumstead
Associate Editor

The public is neither powerless nor forced to spend its money for property rights to abate stream pollution. State legislatures hold the key to this problem under their constitutional powers, American Water Works Assn. members were told last week.

"Those who pollute public waters," said John M. Murdoch, Jr., vice president and counsel of the American Water Works Service Co., "have no property rights that entitle them to continue irresponsible discharge of wastes. The state, through its police powers, can stop such pollution."

"Constitutional power is available to prohibit discharge of wastes, without payment of damages although much money loss might be entailed. The only question is: To what extent is the legislative branch of the state government willing to go in authorizing the use of police power?" The legislature must fix the standards and limits of permissible pollution; it must weigh the social advantage of land use and industrial development against the public needs.

• **Legal points** Murdoch, whose talk keyed a pollution conscious, four-day annual meeting of AWWA at Philadelphia, added that legislatures must strike a balance in a general law, to be enforced wherever applicable.

"The difference between police power and the right of eminent domain should be understood," he continued. "The exercise of police power is an inalienable right of the state, and the state must protect health and safety of its inhabitants. This is done under police powers.

"When acting in a reasonable exercise of police power, the state is not required to pay compensation to interests adversely affected.

"But, when property itself is required by the state, it must be taken by the power of eminent domain, and owners must be compensated.

"Most importantly, though, this should be understood: The exercise of police power for protection of the public welfare is not the exercise of the power of eminent domain."

• **Tooth protection** Among other principal discussions at the Philadelphia meeting was a tentative report on results of a fluoridation program at Newburgh-Kingston, N. Y.

According to Charles Cox, water engineer of the state Department of Health, early results are sufficiently encouraging that the state has sharply modified restrictions on fluoridation previously imposed.

Newburgh children, who have been using water with fluorine show 50 percent less tooth decay since the experiment was started in 1945, than do children of Kingston, where water does not contain the chemical.

For this reason, the state department has dropped its requirement that any community wishing to add fluorine to its water, set up elaborate medical and dental organization.

• **Awards**—New honorary members of AWWA include: G. W. Pisey, general manager, San Francisco Water Department; Jack Hinman, consulting engineer of Iowa City; and Murdoch.

The John M. Goodell prize (sponsored by ENGINEERING NEWS-RECORD) was awarded to A. P. Black, professor of chemistry, University of Florida; W. Victor Weir, president of the St. Louis County Water Co. (and new AWWA president), and A. E. Berry, director of sanitary engineering, Province of Ontario, of Toronto, for a policy report on adding fluoride to public water supplies.

Joseph Schwada, city engineer of Milwaukee, received the John M. Owen Award.

Next meeting will be held in Miami.

Resume Delaware bridge construction work

All work was resumed May 25 on the strike-bound Delaware River Memorial Bridge, after a spectacular settlement of a labor dispute that finally involved a trans-Atlantic telephone call to a union official.

The two-weeks old controversy (ENR May 18, p. 27) started with a walkout by operating engineers, who sought to force signing of a contract between their union and H. C. Eastburn & Sons Co., grading contractor on a bridge approach. The grading contract will be completed in 30 days.

A picket line established by the operating engineers had the effect of slowing and in some cases halting the work of two other contractors. Merritt, Chapman & Scott (substructure) and American Bridge Co. (superstructure). Some workers for these two contractors honored the picket lines, others did not—but work was grinding to a halt on the $40,000,000 bridge as the operating engineers continued to stay away.

The end of the confusing dispute came with a telephone call May 24 to William E. Maloney, an international officer of the operating engineers' group. Located in London, Maloney conferred with union officials and contractors meeting in Wilmington. Soon after the telephone conference, picket lines disappeared. No settlement terms between the disputants were announced, however.

Only bar to full operation now, engineers said, was recalling full manpower. Many workers had returned to their homes or found other work when the strike dragged out longer than had been expected.

BIG WIND—This Superior, Wis., coal dock was wrecked recently by a sudden windstorm clocked at 88 mph. Two others were similarly destroyed. (Acme Photo)

Traffic goes down and around Washington's Dupont Circle

Dupont Circle, astride busy Connecticut Avenue connecting Washington's residential Northwest with downtown, no longer ensnares District drivers. Recently completed was a $4,775,000 vehicular underpass.

Trolleys used to buck southbound traffic around the circle. Now they skirt its perimeter underground. Connecticut Avenue traffic, formerly beset by the upsurging of four other streets, now tunnels straight through. Surface traffic now flows in fixed lanes. About 53,000 vehicles daily will pass around and under the circle, more than 5,000 at rush hours. There'll be 560 trolley trips through it daily, plus numerous bus runs.

John McShain, Inc., Philadelphia, was contractor. It was a unique builder of the Pentagon early in the war, it now building the $21,000,000 General Accounting Office and rebuilding the White House in Washington, and building a $16,500,000 federal health structure at nearby Bethesda, Md.

The underpass structure alone required 25,000 cu yd of concrete and 2,850 tons of steel. There were 151,338 cu yd of other excavated. There are three tunnels, one each for north- and southbound trolleys, one straight through for vehicles. The transit tubes are 3,400 ft long and 14 ft 6 in. high. The vehicular tubes have 22-ft roadways with 3-ft safety walks and a 4-ft median strip. They also are 14 ft 6 in. high. There's an underground trolley loading platform.

(Washington Post Photo)

Announce new rules for Wherry Act housing

New uniform procedures to be followed by the Army, Navy and Air Force in selecting sponsors and processing projects for so-called Wherry Act housing have been distributed among the military services and the Federal Housing Administration.

These aim to speed site selection and construction through the use of local architects and engineers. They call for competitive bidding against identical plans and specifications, as required by a recent amendment of the Housing Act.

The new rules apply to all installations where proposals have not been previously requested. Where proposals have been submitted under the old system it will apply.

Whenever Army, Navy or Air Force decides that housing should be constructed at any installation, the number and type of dwelling units will be announced by the installation commander. Then the appropriate district engineers for the Army and Air Force, and district public works officers for the Navy will negotiate contracts with local architect-engineers for plans and specifications. Close liaison will be maintained with the local FHA field offices.

When plans and specifications are ready, application or pre-commitment for mortgage insurance will be made to the FHA. After commitment is obtained, district engineers or district public works officers will issue invitations for bids, using an approved procedure.

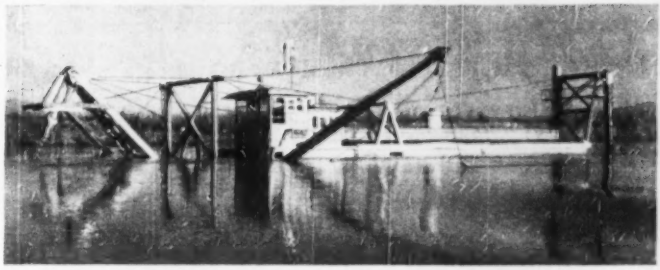
The low bidder will become the sponsor of the project. He will complete his arrangements with the district engineer or the district public works officer for obtaining financing and the contract method.

Construction will be supervised by FHA inspectors in the same way as other FHA-aided housing projects.

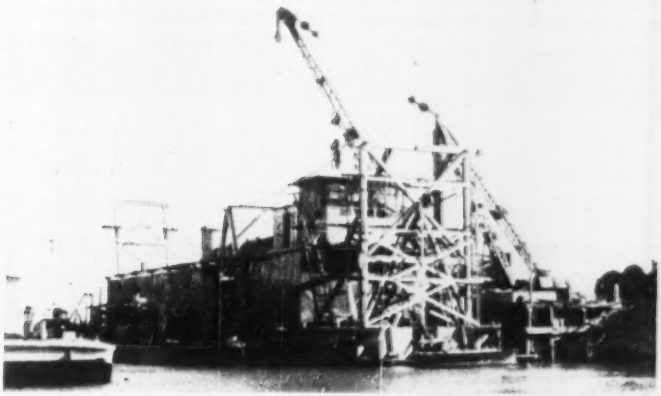
Additional highway funds

Additional highway funds are being made available through general fund appropriations and from bond issues. Rhode Island will vote on a $12,000,000 bond issue. New Hampshire has a proposal for $5,000,000 in bonds. Proceeds would go to primary and secondary highways. A one cent gasoline tax would be continued until the bonds are retired. Mississippi has a new program whereunder proceeds of sales taxes on motor vehicles and tackle shop sales amounting will go to the counties for secondary roads. And the Oklahoma Turnpike Authority has sold $31,000,000 in bonds to finance bridges at Tulsa.

Sunken dredge "Colorado" . . .



. . . raised and ready for service



Rehabilitation of the U. S. Bureau of Reclamation dredge "Colorado" which sank last month at its moorings was completed early in May. The craft will return to Bonnieheaton working on the Colorado River soon.

The total cost to raise and put the dredge back in operating condition was approximately $50,000, or about 6% of the low bid received for building the dredge. According to the bureau, all work was done by government forces. The dredge was described in ENR March 31, 1949, p. 95, and information on the sinking and raising was supplied in a letter by E. A. Moritz of the Bureau of Reclamation to ENR May 4, 1950, p. 16.

A board of investigation appointed by the bureau concluded that water entered the hull in the center pontoon at the bow through a section type valve. The valve had been left open while dredging.

Usually these valves open under above water. However the dredge was somewhat lower at the bow than intended in the design, a shift in the river bed loosened the after spud, causing the dredge to dip downstream, tightening the anchor cables and further depressing the bow, and finally water entered the forward pontoon through the faulty valve. Once the bow went down, water permitted water to enter openings on the deck. The dredge was raised by pumping out timber shored cofferdams placed in the several compartments of the hull.

Many minor changes have been made by the bureau to prevent a similar occurrence. All openings in the deck and in the pontoon sides are being closed. Electrical wiring and spud hoisting cables were removed from the hull and placed well above the deck. Sump pump discharges are piped so bilge water spills some 2 ft above the dredge deck. A 12-in high coaming will prevent water entering the open engine room compartment hatches.

Included on the board of investigation created by the bureau to study the possible causes of the sinking of the dredge was Ian Allen, a dredge designer who acted as consultant for Pacific Coast Engineering Co. on the original design and construction of the dredge. W. C. Beattie, mechanical engineer formerly with the Bureau of Reclamation, and E. R. Dougherty, assistant regional director, Region III

CONSTRUCTION BUSINESS

Labor contracts raise wages 10-12½¢; some unions swap cash for welfare

Labor agreements this spring have contractors' labor costs an average of 12½ cents hourly for skilled workers, 10 cents for laborers, the pattern of agreements to date indicates. This comes to about a 5% increase for skilled workmen and 7% for unskilled.

Most bricklayers are capitalizing on their bargaining position.

Here's the general pattern by region and size of city:

• **Big cities in Northeast.** Unions in big eastern cities and in Chicago are getting a lot on direct wage increases to get welfare funds. They're also willing to go part way with contractors to gain wage stabilization with two-year contracts.

So labor costs went up so much in Washington, New York, Chicago and Boston. But Philadelphia rates are all over the lot: plumbers, plasterers and lathers took 25-cent increases and no wage gains for carpenters, while straight wage increases go from 10 cents for laborers to 25 cents for bricklayers.

• **South and West.** Unions in the South and West are getting straight wage hikes. So are medium-size eastern cities like Buffalo and Baltimore. Unions in most cities of the Middle and Far West are getting a 12½-cent hike.

Here's a breakdown of the differences between these cities and those of the biggest unions in the east. And there's no attempt to see how these wage deals work out.

• **Welfare plans taking hold.** It will be months before N. Y. City steel firms and other eastern firms can put in their welfare funds. But carpenters in Chicago (Electrical Construction and Maintenance, p. 38) and Northern New Jersey (ENR May 11, p. 38) have already begun to collect welfare money.

Some important cities where general settlements should be announced soon are Denver, Los Angeles, New Orleans and St. Louis.

Summary of labor cost increases
General Pattern

	Immediate	Later	Period
Bricklayers			
Carpenters			
Cleveland			1 year
Detroit			1 year
Indianapolis			1 year
Kansas City			1 year
Laborers			
Milwaukee			1 year
Painters			
Plasterers			
Plumbers			
Pittsburgh			1 year
Rochester			1 year
Rodmen			
Structural steel			
Teamsters			

Some other increases

Boston	
Chicago	
Cleveland	
Detroit	
Indianapolis	
Kansas City	
Milwaukee	
N.Y. City	
Pittsburgh	
Rochester	
Los Angeles	
Philadelphia	
Washington	

Lumber output high, but demand's still higher

Mills reporting to the National Lumber Trade Barometer shipped 3% more lumber than they produced in the week ending May 13.

But their production matched new orders for the first time in months. For the year to date, shipments have averaged 2% more production; orders have averaged 2% more production.

• **Douglas fir output high.** Douglas fir mills the second week in May turned out 5% more than they produced in the week before. But they produced 4% less than in the week ending May 6. Shipments were 1% more than production.

Aluminum up ½ cent

Aluminum Co. of America upped its price of aluminum ingot ½ cent a pound, the eighth price change since World War II. The increase, effective May 15, brings the price to 17½ cents a pound for 99% pure metal in the ingot form. Price of aluminum sheet, plate and rolled products remains unchanged.

Industrial Building is rising fast

There's another good year ahead for industrial building contractors and suppliers. It won't be as big as '48, but it may rival '49.

• **Contract awards spurt.** May contract awards for new industrial building took such a jump they brought the cumulative 1950 total to $480 million, 24% ahead of last year.

Ever since February, industrial building contracts have shown growing strength. By mid-April they had brought 1950 equal with a year ago. At the end of April, they were up 4%. The May total of $125 million in contracts compares with $85 million a year ago, a 46% increase.

• **Where is this new plant?** The Middle West, South and Southwest are getting most of the new industrial building this year.

• **What industries are building?** Contracts for new construction of auto factories have been big.

Other industries contracting more new building so far this year than last are the chemical, food, metal-refining and rolling, and the machine and machine parts industries.

Industrial Buildings Contracted
by type of industry
(in thousands)

	4 months 1949	1950	chg
Automotive			
Chemical			
Food			
Machine & machine parts			
Metal-refining & rolling			
Petroleum			
Total buildings			

Industries raise plant and equipment budgets

The rise in industrial building is really cooking from contract reported to ENGINEERING NEWS-RECORD, reports Dodge Chief Economist Dexter M. Keezer. Keezer says that plans for new plant and equipment projects are also rising.

A survey of capital investment intentions by industry shows the total for 1950 at $23.5 billion. Plant and equipment projects estimated for 1951 indicate a total of $22.4 billion.

The survey, made by the Department of Business Economics of the McGraw-Hill Publishing Co., Inc., also shows that nearly one-third of the 1950 total has been spent. By the end of March, 31% of the year's plant and equipment projects had been completed.

BIDS AND BIDDERS

Major project news received after Construction Reports, page 66, went to press.

Subway—Rayner Construction Ltd., Leaside, Ont., was the successful contractor for Sections S-3, S-4 and S-5 for Yonge Street Subway in Toronto, to cost about $7,000,000. Toronto Transportation Comm. awarded contract.

Hospital—Pennsylvania General State Authority, Harrisburg, plans Eastern Pennsylvania Psychiatric Institute in Philadelphia. Estimated cost is $7,200,000. Hough, Livingston & Larson, Philadelphia, are architects. A. E. Jones is engineer for owner.

Housing—J. E. Millstone Construction Co., St. Louis, Mo., was low bidder at $7,500,000 for building public housing for the St. Louis Housing Authority. George Hellmuth and Associates, St. Louis, are architects.

Bridge—Frederick Snare Corp., New York, N. Y., will construct $5,475,000 bridge over Reynold Channel, Atlantic Beach, N. Y., for Nassau County, Mineola, N. Y. Hardesty & Hanover, New York, are consulting engineers.

Residences—Wolhorn Biofactic Building, N. Y., plans constructing residences at Bayside, N. Y., to cost about $7,500,000. A. H. Silkowitz, Jackson Heights, N. Y., is architect.

Hospital—Gilbane Building Co., Providence, R. I., has been awarded $5,529,955 contract for dormitories at State Institutions, Taunton, Mass., by Department Mental Health, Boston. Leland & Larson, Boston, are architects.

Steam Electric Plant—South Carolina Electric & Gas Co., Columbia, S. C., plans steam electric plant at Hagood, near Charleston, S. C., to cost about $5,475,000. Contract will be awarded in 1951.

Piers—Port of Boston Authority, Boston, has awarded contract for the construction of piers in Boston Harbor at Charlestown to Merritt Chapman & Scott Corp., New London, Conn., at $5,472,117. Thomas Worcester, Boston, is consulting engineer.

Bridges and Roads—Pennsylvania Turnpike Commission, Harrisburg, received low bid for constructing bridges and roads Section 50E Pennsylvania Turnpike from Hanson Construction Co., Pittsburgh, at $2,236,767 and for Section 50L from Patterson Construction Co., Monongahela, at $2,422,071. Both projects are in Allegheny County.

Department Store—May Co., Cleveland, O., plans to construct department store in Rocky River, O., to cost about $3,000,000.

Dwellings—Plantation Development Corp., Houston, Tex., plans group of dwellings to cost about $3,500,000. Perry Johnson, Houston, is architect.

Aircraft Factory—Del E. Webb Construction Co., Los Angeles, Calif., will construct aircraft factory at Culver City, Calif., for Hughes Aircraft Co., Culver City. Estimated cost is about $2,000,000.

Housing—New York City Housing Authority, awarded contract Section 2, Melrose Homes, to John A. Johnson Sons, Brooklyn, at $2,588,000. The same contractor is now working on Section 1. Louis E. Jallade, William F. Koch and Louis E. Jallade, Jr., New York, are architects.

High School—Board of Education, Los Angeles, Calif., will open bids June 21 for San Fernando High School. Cost is estimated at $2,000,000. Albert C. Martin & Associates, Los Angeles, are architects.

Dike Reservoir—Geo. H. Jones Construction Co., Oklahoma City, Okla., was low bidder at $2,780,717 for earth work, Spec. 1, Dike Reservoir project near Pierre, S. D. U. S. Engineer, Omaha, Neb., opened bids Mar. 29.

Plant, Office and Warehouse—The Austin Company, Cleveland, O., will build plant, office and warehouse at Mount Vernon, O., for the Pittsburgh Plate Glass Co., Pittsburgh. Estimated cost is $2,000,000.

Apartment—Morris Pickman Enterprises, N. Y., plans three apartment houses in Linden, to cost about $2,500,000.

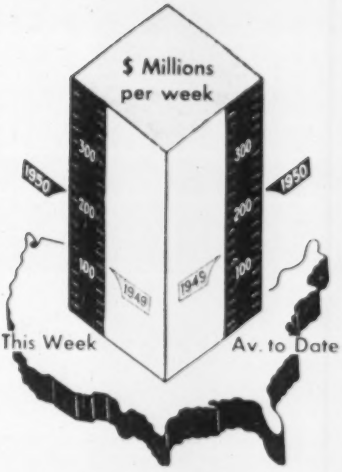
Bridge—City of Boston, Institutions Department, awarded contract for viaduct over Boston Harbor from Moon Island to Long Island to Merritt Chapman & Scott Corp., Boston, at $2,593,471. Capeless Engineering Co., Boston, is engineer.

Road—Sayen Construction Co., East Hartford, Conn., was low at $2,510,658 for constructing road in Gloucester, Camden and Burlington Counties when the New Jersey Turnpike Authority, Trenton, N. J., opened bids May 23. Fleming, Cuddy & Cagen, Inc., Essex, is consulting engineer.

COSTS AND VOLUME

ENR INDEX NUMBERS

Index	Base	100	1913	1926
Construction Cost	May 26	356.51	2284.65	
Building Cost	May 26	361.27	196.35	
Volume	Apr. 26	382	124	



Activity This Week

As reported to ENR in millions of dollars

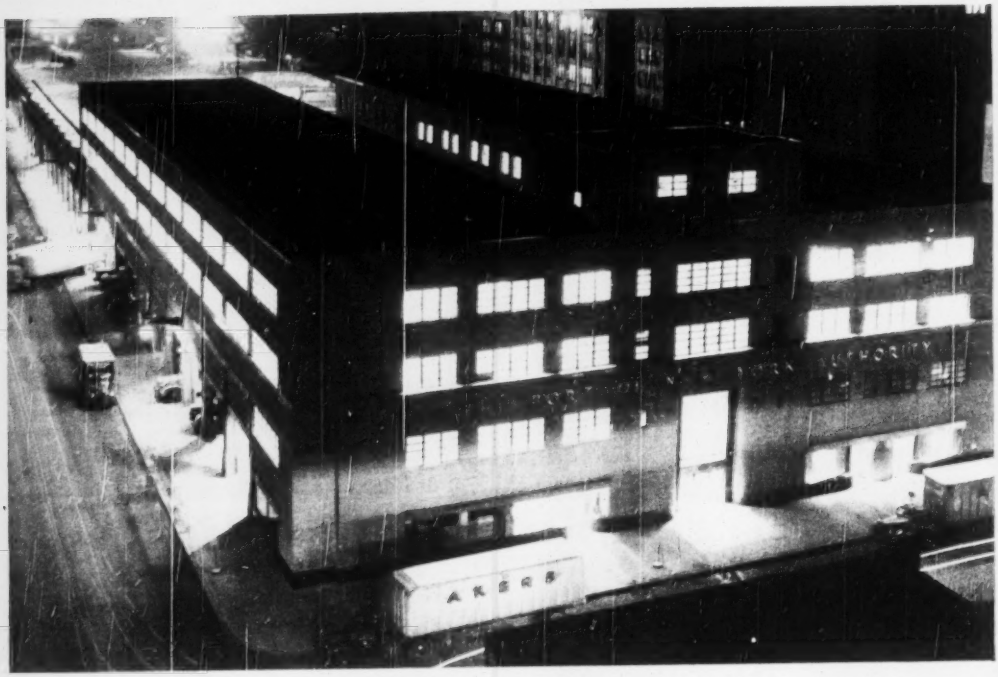
Amount of contracts let

	1 Day Week of June 1	1950 wks	1949 wks	Cumulative chge
U. S. total	$196.4	$1,612.8	$1,760.9	-10

Contracts by type of work

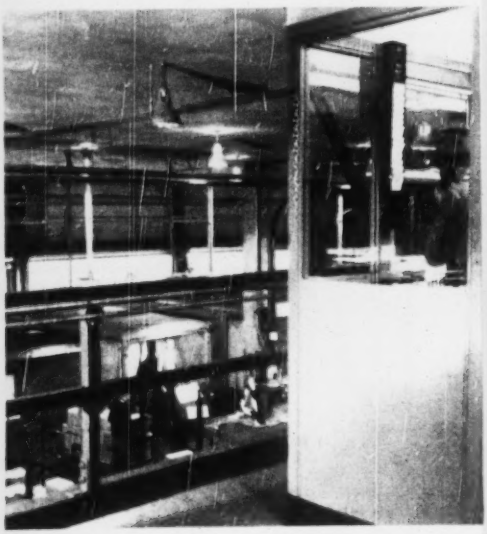
	This Week	1950 wks	1949 wks	Cumulative chge

Apartment—Louis R. Solomon & Associates, Chicago, are asking bids for the construction of 17-story apartment in Chicago. Estimated cost is about $2,500,000.

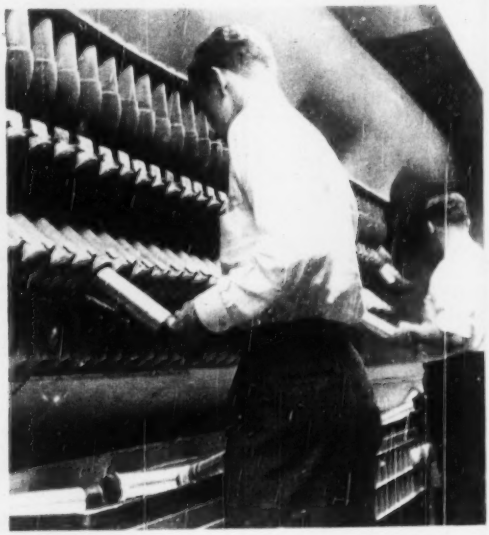


TERMINAL near the Holland Tunnel in New York City will keep many over-the-road trucks off city streets.

Truck Terminals Reduce Handling Costs



1 Dispatcher in gallery office checks on shipment being unloaded from over-the-road carrier onto flat carts—makes use of . . .



2 Pneumatic tubes to speed dispatching. Control section on a mezzanine processes papers thus received. Then . . .

With completion in June of the Newark Union Motor Truck Terminal, the Port of New York Authority now has two truck terminals in operation in the New York Metropolitan area. Both receive less than truckload traffic (mixed merchandise shipments) and sort it for interchange between over-the-road units and local city trucks. Mechanical handling and consolidating features are expected to reduce truckers' handling costs, compared with individual terminals.

In addition, traffic congestion on city streets is decreased. It is unnecessary for many over-the-road trucks to pass through the more congested streets of New York City or Newark to reach their terminals. Neither do these block streets when parked for loading and unloading.

• **The New York terminal** was first to be completed, went into operation last November. It is located in downtown Manhattan on four blocks from the Holland Tunnel, main artery for trucks from the south and west. The structure is 1,000 ft long and 173 ft wide, including a 5-story office portion and a maintenance and repair station at one end. Parking space for 115 trucks is provided on the roof.

The freight platform, 800 ft long and 50 ft wide, will accommodate 144 trucks. At one end is a 10-ton overhead crane for cross-platform handling of heavy loads. Longitudinal movement of freight is accomplished with flat platform carts that engage an overhead conveyor suspended from the underside of the dispatch gallery and running the full length of the platform.

• **The Newark terminal** two miles from the center of the business section of that city—is adjacent to N. J. Route 25 (U.S. 1), main artery from the south and west, and the New Jersey Turnpike, now under construction. Only 0.4 miles south of the Holland Tunnel, it also is located conveniently for trucks coming from the north and east.

The Newark building is 1,174 ft long and 202 ft wide. Its freight platform, 1,022 ft long and 100 ft wide, accommodates 164 trucks. Mechanical handling of freight differs from that used in the New York terminal in that the longitudinal conveyor is under the floor. This is believed to have the advantage of safe operation at higher speeds, reduction of mass handling of more trucks on the conveyor line, resulting higher productivity per man-hour and an increase in the over-all efficiency of the entire operation. The chain conveyor operates about 5 in. under a slot in the platform. To attach a flat cart, a platform man lowers a short bar at the front of the cart to engage a dog on the continuous moving chain. When the cart reaches its destination, another platform man detaches it by raising the bar.

• **Design features** in both terminals dispatching is facilitated by pneumatic tube, public address and two-way intercommunicating systems.

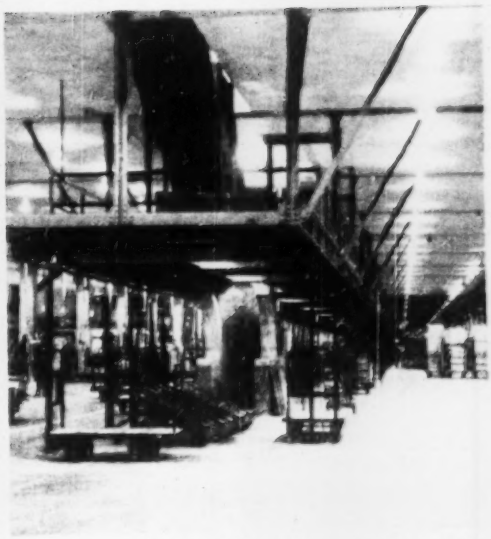
With the exception of a 175-ft long section of reinforced concrete at one end of the Newark terminal, both buildings have structural steel frames and brick walls. Truck berths are paved with reinforced concrete. The platform floor is asphalt block, except at the conveyor, where it is concrete treated with a hardener. Floors in the office section are asphalt tile on concrete and in the dispatch gallery are cork fill over light gage steel decking. The New York terminal has a concrete parking roof, the Newark structure composition roofing over light gage steel decking.

The terminals were designed and are being operated by the Port of New York Authority, for whom John M. Kyle is chief engineer and Walter M. Quirk, architect.

New York Union Motor Truck Terminal cost \$7,000,000. Caldwell-Wright Co. was awarded the general contract on a \$3,537,000 bid. Clinton Shepherd, Wilson & Konge the foundation contract on a \$735,965 bid, and American Bridge Co. the steel contract on a \$760,247 bid.

Newark Union Motor Truck Terminal cost \$5,000,000. James J. Waters Corp. was awarded the general contract on a \$2,085,240 bid. Stock Construction Co. the foundation contract on a \$769,470 bid, and Harris Structural Steel Co. the steel contract on a \$677,658 bid.

3 Platform man couples flat cart to overhead conveyor (in New York only—Newark has under-floor system) and . . .



4 Flat carts unattended move the length of the platform. They are detached at local truck loading station

THE NORTH SIDE POOL is ready for the 1950 season. It has ample sunbathing area including a deck above the bathhouse. Flood and underwater lighting permit night swimming.

How to Design a Swimming Pool:

- 1,000-swimmer capacity
- Ample sun-bathing area
- Diatomite-earth filters
- A rugged, efficient bathhouse

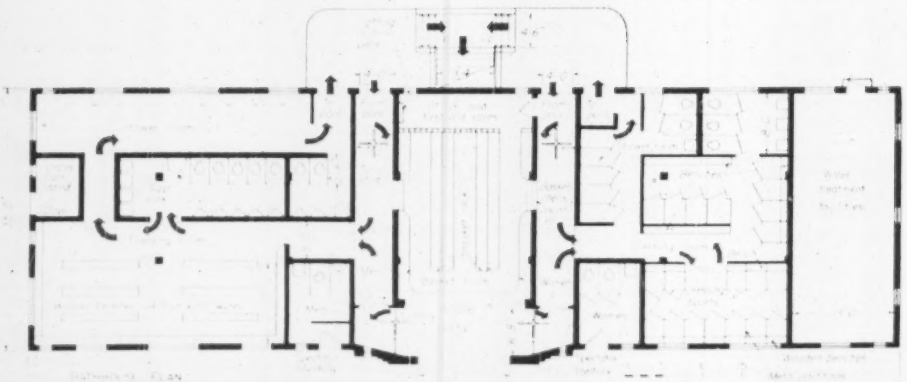
Paul M. Holmes
Sanitary Engineer
Allen E. Sibley Associates Ltd.
Columbus, Ohio

WHEN THE SUMMER SEASON rolls around, the people of Hamilton, Ohio will have a brand new up-to-date swimming pool ready for operation. The North Side pool, the first of two to be built, opened its gates on the traditional first day, Memorial Day.

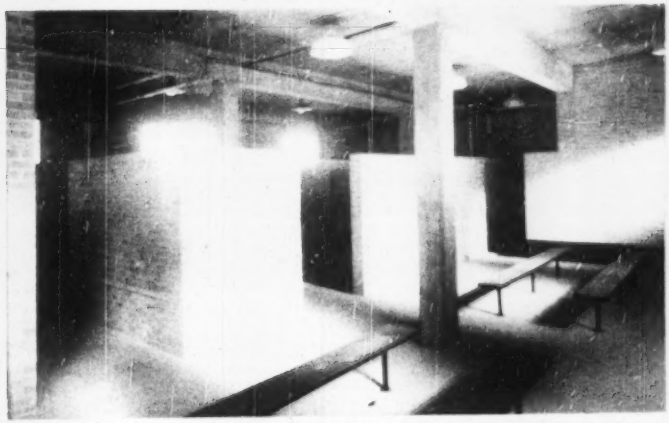
Completed after a long, wet-weather delay, the pool is the first step in expanding the city's recreational facilities. Built at a cost of $365,000, it points up the kind of design practices that make for good swimming, pleasant surroundings and protective sanitation.

• Location. When the city decided to build swimming facilities, two possibilities were considered. One pool at a central point or two pools in widely separated areas. The latter plan was chosen because it serves the public's interests better.

The North Side pool is adjacent to a junior high school on a site entirely devoted to recreational activities. Adequate auto parking space is available



BY ROUTING PATRONS from the dressing rooms, by the toilets and into the showers, the bathhouse layout stimulates better swimmer cleanup.



THE MEN'S DRESSING ROOM has sturdy wooden benches and low-height partitions around toilets to improve ventilation.

SWIMMERS can enter the pool only by passing under a bank of showers.

Public transportation to the site.

It is estimated that the pool in this location will serve a population of 15,000.

• **Size**—Drawing from 25% of the city's population, the pool is designed to handle 1,000 swimmers at a time. Swimming and diving areas are expected to handle patrons in the ratio of 3:1. Pool size is about 75x150 ft.

Total deck area at pool level is 9,100 sq ft. This is made up of a 20-ft deck between the pool and bathhouse and 15-ft walkways on the other three sides.

An additional sun bathing area of 4,000 sq ft on the roof of the bathhouse—lends itself to other uses such as a spectator's gallery and outdoor dancing. The mopped-on membrane waterproof roofing is topped with a 3-in. concrete wearing tile. Access is by stairs from the pool level.

These swimming and "loading" areas provide more than 24 sq ft per person under maximum load.

• **Water sanitation**—Water treatment sequence is: Hair-and-lint strainer, diatomaceous-earth filtration and chlorination. Circulation is by a side-suction electric-motor-driven centrifugal pump.

Clean water enters through 24 submerged inlets spaced around the pool to insure uniform circulation. Dirty water is drawn off both upward through the overflow trough and downward through bottom outlets. It is carried directly, in sized piping, to the strainer, which is set ahead of the pump. The pump forces the water through the filter and back into the pool after chlorination.

Filtration is by two vertical upflow diatomite units. Each 60,000-gal per hr unit has a normal operating rate of 5 gal per sq ft per min and occupies about 60 sq ft of floor space. Filter shells designed for 100-psi working pressure are tank-quality steel.

The top head of filters is removable, being fastened to the shell by a flange joint. The manifold plate from which filtering elements are suspended into the raw-water chamber is inserted in this joint.

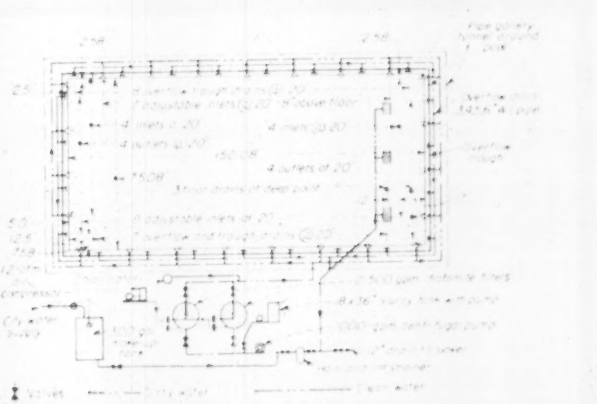
With 30 bronze-wire wound tubular elements in each unit that carry a bed of pressure-deposited diatomite, water is filtered as it is forced upward and through them by pump pressure to the filtered-water chamber. The 3-in.-diameter, 24-in. tubes give a filtering area of 180 sq ft per unit.

Diatomaceous earth as a slurry is delivered continuously during filtration from a 100-gal feeder to the pump suction by an eductor pump. Filter elements are pre-coated with concentrated slurry through a valved connection.

To insure complete removal of compacted diatomite from the element during backwashing, compressed air can be applied to the filtered-water chamber through a quick-opening valve.

• **Pool construction**—The rectangular-shaped pool is built with reinforced-concrete walls, bottom slab and deck.

Walls are designed as vertical cantilevers with vertical and horizontal reinforcing at each face. The main bot-



DIATOMACEOUS EARTH FILTERS purify dirty water—drawn off from the surface and the bottom—continuously. Turnover of pool contents is completed in 6.6 hours.

tom slab is reinforced with 6x6 in. No. 6 wire mesh in the top. Horizontal expansion joints are carried on a 3-in. deep footing.

Expansion joints across the bottom slab and adjacent to the walls are filled with 3/4x0.5-in. premolded asphalt strips and sealed with mastic. Similar construction is used for vertical expansion joints.

A 4-in. cross overflow trough is formed into the top of the slab walls. Drains to return piping are 2 in. spaced on 15-ft centers.

A system of subsurface drains under the pool bottom insures a dewatered foundation.

• **Pipe gallery.** Extending completely around the pool, a pipe gallery gives ready access to all pipes and fittings—except those for underdrainage for maintenance and repair. The gallery is 5 ft wide and variable in height.

Inside walls of the gallery are the concrete pools walls; the outside are concrete block which support the pool deck. At the deep end of the pool, the gallery is floored with concrete to give a 5-ft height. The remainder is paved with crushed rock.

Support for influent and effluent piping are concrete block. These grade so that all pipes drain by gravity. All pipes are wrought iron.

Architecturally, the bathhouse is pleasing to the eye, indestructible from the standpoint of fire and vandalism. It is also economical in first cost and for maintenance.

The long one-story structure has walls of architectural concrete to harmonize with the pool. Horizontal pour lines become part of the architectural treatment. Wall and roof-slab surfaces were formed against resinous faced plywood. Tie rod holes are filled and all surfaces are finished with grout and rubbed down.

High windows provide light and ventilation in dressing rooms.

The focal point of the bathhouse is the large main entrance. A cantilevered slab over it supports on its edge the words—Municipal Pool—in large stainless steel letters.

• **Bathhouse.** Symmetrical around a center entrance, the middle section of the 4,000-sq ft bathhouse houses a lobby, cashier's booth, room and office and first-aid station. The lobby is erected to 18ft 8 in. to minimize

SCHEDULE OF FEES

(per swim)

Children, 16 yrs and under	$0.20
Adults	.35

(Fees include 20% for federal tax)

No reduction is given for season tickets

fostering—divides the male and female dressing quarters. A transverse corridor separates it from the basket room. Entrance to dressing quarters is through trash-proof turnstiles.

The basket room is divided longitudinally into three aisles giving access to six rows of racks with more than 1,200 baskets.

The office and first-aid station are at the rear of the basket room directly adjacent to the pool.

The men's dressing room is open but the women's has dressing booths for compliance.

Bath dressing rooms feature chemicalization of patrons as forethought that makes for better bathers cleaning for plant.

After depositing clothes-filled baskets at service counter, swimmers use central foot toilet and individual showers before entering the pool from either side of their respective dressing rooms.

Returning swimmers enter the bathhouse by a corridor to basket storage, pick up their baskets and go directly into the dressing rooms.

Separate wet mezzanine toilets are in each dressing room. Toilets are also provided for spectators.

• **Engineers and contractors.** The project was designed and construction supervised by Aylsworth, Stilson & Associates, Ltd., Columbus, Ohio. General contractor was Carl J. Conrad & Sons, Inc., of Hamilton.

DESIGN AND ENGINEERING DATA

The North Side swimming pool, Hamilton, Ohio

Location: Residential district, public park, three-direction entrance, north; public transportation available, adequate parking space for cars.

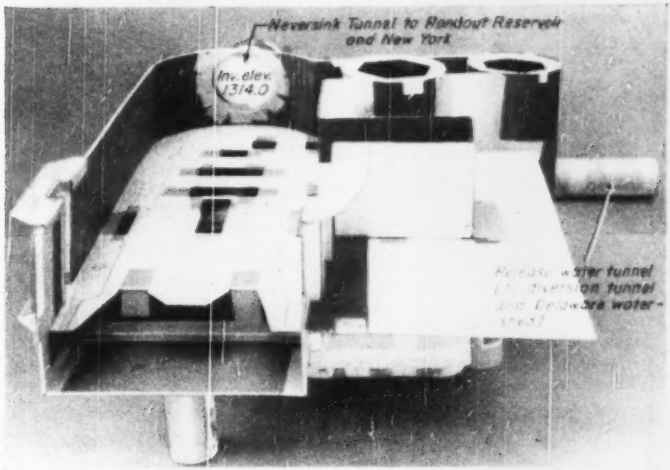
Capacity: 1,000 swimmers maximum based on 25% of [illegible] = 50,000 population in the immediate vicinity plus 10% of remaining population = load equals 5% of 50,000 total contributing population.

Size of pool: Surface area 75.08x150.08 ft or 11,268 sq ft; depth of swimming area 4.5 ft; depth of diving area 5.10 ft; maximum water content 480,000 gal.

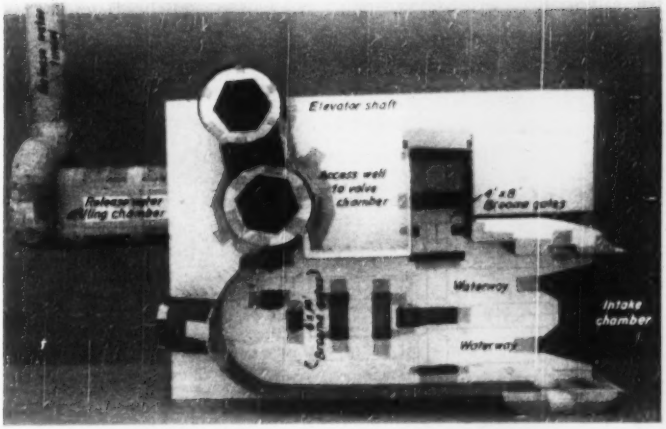
Deck area: [illegible] sq ft = 57 ft 20 ft wide concrete walk at pool level; a mid-pool junction of east-to-bathhouse recreation area at pool level = 2 one-meter and 2 three-meter diving boards, chairs for lifeguards and [illegible].

Recirculation: Continuous recirculation of water, 24 hr per day except during night hours. Water and [illegible] 6.67 hr turnover. 8 in. pipe and 10 in. pipe [illegible] entered flow meter [illegible]. Design capacity [illegible] pipe [illegible] 1,250 gpm [illegible]. One 5-hp motor-driven centrifugal pump with [illegible] capacity 1,250 gpm [illegible] electrical controls [illegible] protective relays [illegible] 42 in. [illegible] 1,250 gpm [illegible] 1,250 gpm [illegible] 1,250 gpm

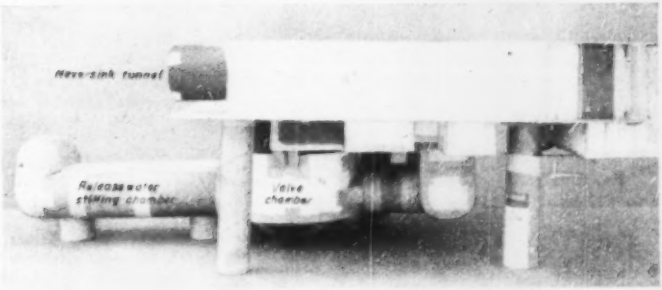
Cheap Model Helps Field Men Understand Job



OUTFLOW CONTROL CHAMBER construction at Neversink Reservoir is easier to understand, thanks to this job-made model. Out-to-out volumes represent rock excavation.



MAILING TUBES, cardboard, drawing paper, and tape are the model's chief materials. Plan view shows how drawn-on information supplements scale volume information.



ROCK EXCAVATION at lower levels (side view) is for release-water control. Columns merely support model. Structure will be 130 ft below ground. —BWS photo

A Banker Tells the Why and How of . . .

Bank Financing of Equipment

E. I. H. Bennett,

Vice President, Peoples First National Bank & Trust Co., Pittsburgh, Pa.

For many years the financing of construction equipment was viewed by some bankers with a very critical eye. They felt, without real investigation, that this kind of financing was extremely hazardous, that it was not a bankable banking function and that the risks more than offset the profit potential.

Recent developments, expressed in terms of favorable experience (which is the criterion for improved methods on the part of the lenders), have radically changed that concept. Today, the financing of heavy income producing equipment is clearly recognized as not only a sound, banking function, but also a very important one.

The success or failure of any phase or type of lending depends almost entirely upon the basic policies observed and the care exercised by the lending institution. Even financing of home improvements under a government insured plan can carry with it a great deal of risk if sound credit principles are ignored and if proper selling practices are not observed.

Because of the substantial amount of credit required when we finance construction equipment, the importance of observing sound practices becomes obvious in this specialized field. There are many points to watch, the most important of which I believe may be briefly summarized as follows:

1—Dealer selling methods. In this stable industry, selling policies and practices are certainly well above those found in certain other fields. However, we do find a tendency at times for dealers to high pressure the customer into a piece of equipment not at all suitable for his needs, with the result that the customer is later dissatisfied. On other occasions, the dealer may overcharge the customer or misrepresent certain facts and these too create ill will. While instances certainly the exception, they do occur and we feel that as a financing agency we must insist upon sound, reputable selling practices on the part of the dealer.

2—Purchaser's financial status. We are frequently asked why we place so much emphasis on the financial condition of the purchaser, we have already been on the agreement, so isn't that ample collateral?" The answer, of course, is no. We would not have considered a sound credit institution if we financed a Cadillac for a $25 per week office boy, or if we approved a mortgage on a $30,000 home for a $50 per week laborer.

Equipment financing has analogous situations. And we must look to financial stability, financial ability to pay and general character to determine whether we can expect repayment under reasonable normal conditions. On contracts of less than $10,000 we rely on direct investigation, and seldom require detailed financial statements, but on larger deals such data are required in sufficient detail to enable us to form a firm opinion and arrive at a prompt decision. With this we must consider also the business in which the purchaser is engaged.

3—Repayment requirements. Having established satisfactory dealer relations and determined the satisfactory status of the purchaser, the next important consideration is the terms of sale and repayment. What down payment is to be made, and over what period of time will repayment be made? In order that the buyer may have something in the deal to give him a greater feeling of responsibility, require that he pay, in advance, at least 25% of the net selling price; in some cases we insist upon 33⅓%. That is standard. There is little question about down payments in those proportions.

On the question of maturities or length of contract we follow a conservative pattern and require repayment generally over a period of 12 months. On this, however, there is less standardization than on the question of down payment, for we should and do consider the ability of the buyer to make either heavy monthly payments. How long will the job last? How much income will be produced by that piece of equipment? Will monthly payments on a 12 month basis leave him short of much needed working capital? While we endeavor to write notes for 12 months, it frequently happens that an 18 month payment schedule is far more desirable and we have had cases where we have stretched it out over a 2 year period. Flexibility in this important question should be one of the characteristics of the lending policy.

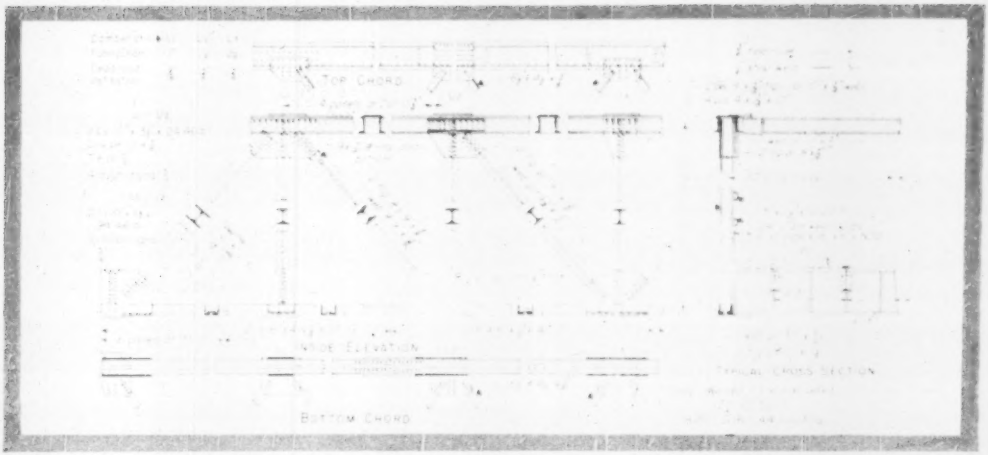
4—Lien instruments. An important consideration in this specialized field is the type of lien instrument used. Unfortunately, that cannot be discussed here because of the wide variations in state laws. It is an important phase of financing, however, the bank must make a careful study, through competent legal counsel, to determine the proper instrument, the filing or recording requirements and the bank's specific rights in other states if the equipment may be moved out of its local jurisdiction.

5—Collection. The lending institution, if it is to be successful in this or any type of installment financing, must observe sound, firm, but fair, flexible collection policies. Prompt follow up for delinquent installments is doubtedly essential for failure to get quick action may result in substantial loss. The contract specifies dates and amounts of payments, and we feel that we should insist upon strict adherence to that contract.

It is recognized, however, that unforseen conditions may arise that make it impossible for the borrower to fulfill his promise exactly as agreed. It we recognize the facts, we have made our plan flexible enough to make exceptions, grant extensions or even refinance the equipment to fit the circumstances. We believe this to be very important, for we constantly keep in mind the need for maintaining good customer relations, not only for the bank but also for the dealer. Whatever we do, good or bad, reflects on the dealer and we want to keep the good will of the dealer at all times.

It works. By keeping these five major factors clearly in mind, we have found it possible to handle this type of financing on a profitable, attractive basis and in a way that has made this an important part of our banking service. There are other problems, to be sure. One of these is the question of dealer recourse versus non-recourse. On new equipment, where values are fairly standard, and where we are dealing with reputable, well established dealers or distributors, we handle the paper on a non-recourse basis. On used equipment, however, where we do not always have true values we require full recourse on the dealer. Another question is that of interest charge. Our standard charge is 6% per annum, a rate which is commensurate and fair when we properly evaluate the risks.

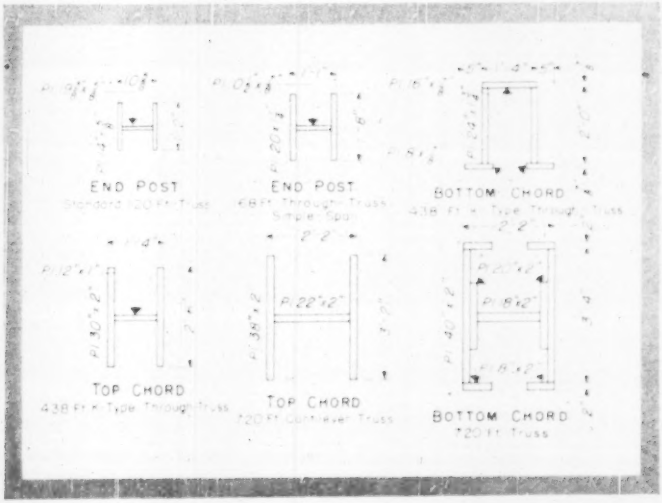
We have been engaged in this field on an active basis for about five years and we have had an opportunity to study thoroughly its advantages and its disadvantages. It all resolves down to the observance of sound, fundamental principles and common sense.



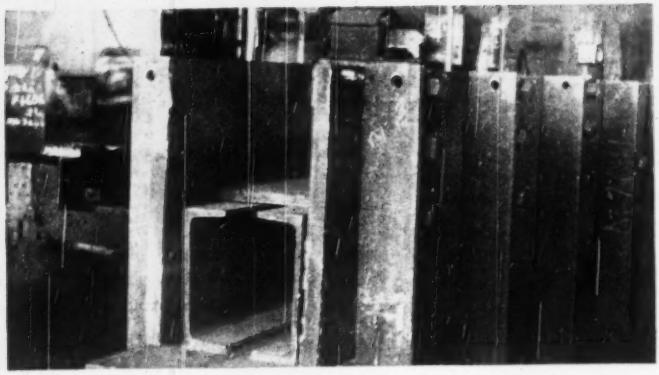
Welded shop fabrication plus riveted field erection is current practice in . . .

Australia's Welded Highway Bridges

V. Karmalsky
Design Engineer, Department of Main Roads, New South Wales, Sydney, Australia



TRUSS MEMBERS in shop-fabricated, field-welded bridges are made up of plates ranging from ⅞ in. thick in a standard 120-ft span to 2-in. for 720-ft cantilever span.



SHOP WELDING a heavy truss member (20x1¼ in. flanges and 10½x⅜ in. web) for a 165-ft simple span. Plates are tack-welded in an assembly jig.

• **Composition of Steel.** A certain limit must be placed on the carbon content of steel to ensure good weldability; carbon in steel increases its ultimate strength but reduces its ductility. The maximum allowable carbon content in welded structural steel specified by the Standards Association of Australia is 0.25%.

Other elements present in the steel decrease its ductility, but to a lesser extent than carbon. For example, six parts of manganese are equivalent to one part of carbon in hardening the steel. The total amount of these elements when reduced to the equivalent of carbon should not exceed 0.45%. Otherwise, the welds tend to develop cracks unless special precautions are taken.

• **Effects of Notching.** Additional stresses are introduced in the weld or in the parent metal by notches in the structural member. A notch is any discontinuity in abrupt change of section under or at the weld causing points and inclusions in welds.

Notch effects in welded steel are not as well known as in riveted work. Certain theoretical data [illegible] but with proper precautions in design and in the use of welding it is possible to avoid notching in welded connections.

In the case of an unplane welded plate under [illegible] against notches [illegible] to be taken by the butt welds of the flange plates [illegible] distance from the center of gravity. This will avoid high bending stresses. The [illegible] are [illegible] as much as [illegible] is near the center of the section to avoid high bending stresses at the ends. Notches [illegible] can be avoided and cross joints [illegible] since all butt welds [illegible] to the axis of the applied stress [illegible] and ground smooth.

• **Notch Sensitivity of Steel.** A certain quality of steel, termed [illegible] a brittle fracture in the presence of notches in the member is called "notch sensitivity." This quality is likely at the normal rolling process [illegible] subsequent heat treatment produces a microstructure in the steel known as "martensite." In this condition the steel consists of thin elongated crystals [illegible] of steel, increased stresses due to notching, fatigue of metal, rapid cooling of weld metal, stresses due to weld being restrained from contraction on cooling, distortion of steel due to welding, and proper reduction of permissible design stresses. The author recently discussed these considerations in detail in a lecture before the Australian Welding Institute, of which this article is an abstract.

• **Fatigue of Metals.** The well-known phenomenon fatigue of metal due to cyclic stressing is an important factor in the design of either welded or riveted bridges. Because of this factor, permissible stresses for welded work in Australia are greatly reduced. The amount of this reduction is based on the relative magnitude of maximum and minimum stresses in the member, and the number of cycles of stress during the expected life of the bridge.

• **Rapid Cooling of Weld Metal.** Another factor contributing to reduced ductility of the weld metal is its rapid cooling by a large mass of parent metal. The thicker the plates being welded, the more rapidly heat is conducted away from the weld. This causes [illegible] weld metal to cool quickly. Very [illegible] Australian bridge practice [illegible] minimum size of weld run for any given thickness of [illegible]. For example, [illegible] are required to deposit [illegible] of metal for ½-in. plates. For thicker plates [illegible] and over.

Special precautions [illegible] to prevent too rapid cooling of welds [illegible] the equivalent of preheating the parent metal. It is [illegible] and preheating of the parent metal are required.

Other precautions in the use of electrodes and the amount of electric current. Both are strictly controlled. Excessive current gives high local heat which is detrimental. Low current permits too rapid cooling of the weld [illegible] undesirable structure produced by rapid cooling. Excess cold seems to aggravate the notch sensitivity of such steel. Preheating does not [illegible] with Australian materials, however, with Australian [illegible] possible due to the absence of severe freezing temperatures.

• **Contraction on Cooling.** Prevention of the contraction of weld on cooling also produces high metal stresses. This is a common fault in welded structures when [illegible] unusual care is not exercised.

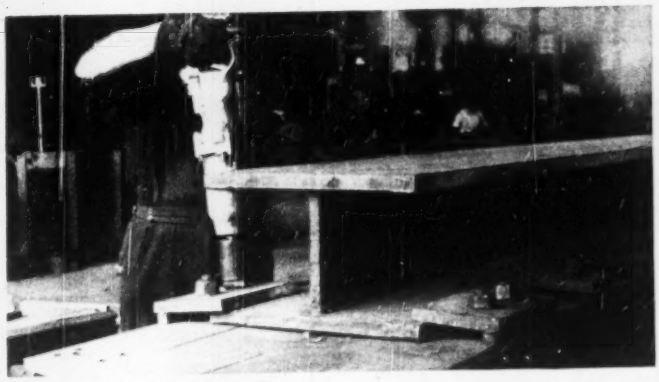
This is how it works. The metal deposited in a butt weld cools to normal temperature. In the process of cooling it contracts. If the two plates being butt welded are free to move on a rocking table, contraction of the weld metal will pull them together. If the plates are not free to move, the weld must crack or at least [illegible] weld.

One method of overcoming this effect of contraction on cooling is shown in the Australian practice for welded plate girders.

Web plates made by butt welding short sections and flange plates are completely welded full length, individually, prior to assembly. During this operation all weld is free to contract.

The completed flange and web plates are then assembled together with stiffener angles. The assembled members are first tack-welded, then completed by continuous fillet welding.

Butt welding of rigid sections should be avoided as it must result in internal stresses in the weld. This is especially true in butt welded connections of stiffeners to rolled beams. If the flanges are welded first, contraction of the weld metal will draw the two halves of the beam together. Then when the webs of the beams are butt welded, that weld material will be pulled from thickness by the previously welded flanges. This will cause large tension stresses, causing cracking during cooling or as soon as the beam is in service.



FLANGE PLATES then are placed over a [illegible] in. packing strip before making 2-in. fillet welds between web and flanges to insure straight flanges after fabrication.

• **Distortion Due to Welding.** Distortion of members and their components due to contraction of the weld metal must be carefully considered in the design and fabrication of welded structures. Every measure must be taken to avoid, or at least relieve, stresses due to the contraction of the weld metal. Welding must be possible should be balanced by symmetrical procedure in relation to the unit being welded. In the members so built up from separate plates, the welds should be placed symmetrically in relation to the neutral axis.

The simplest example of this principle is a double V-butt-welded plate. Rate of welding, placed weld in metal on both sides of the plate. This equalizes between these in effect. Warping by cooling of the weld metal. Since the stresses in the metal on plate will remain the after welding.

Another example: At left, an top chords of trusses made up of two channels and a cover plate, placed another position. Welder is required to connect the channels to the cover plate. These welds not being symmetrical about the horizontal and horizontal axis of the member it will be straight after completion of the welding.

Unsymmetrical members such as top chords of trusses made up of two channels and a cover plate placed another position. Welder is required to connect the channels to the cover plate. These welds not being symmetrical about the horizontal and horizontal axis of the member it will be straight after completion of the welding.

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• **Reduced Design Stresses.** Ever since the N.S.W. Department of Main Roads designed and built the pioneer welded truss bridge [illegible] ft. centers, it has followed consistent design practices. Although working stresses for butt and fillet welds in [illegible] compression in the parent metal, Main Roads' butt welds in tension members are restricted to [illegible] under dead load. Butt welds in members subject to alternating stresses are restricted to [illegible] loading.

These reductions are [illegible] not exceed, even at the [illegible] welded bridge as might be expected for the following reason. As bridge trusses the length of any diagonal supplied to the units is different for all four members to be fabricated without spaces between joint faces. Welding is used to obtain the [illegible] and stretch or bolting, [illegible] bers. Field tests [illegible] of this method. For plate girders, all butt welds are placed at positions of low stress, and no reductions in stress are needed.

• **Sequence of Welding.** A sequence of welding to limit [illegible] distortion must be [illegible] equal that a truss straight members requiring no correction to [illegible] bearing.

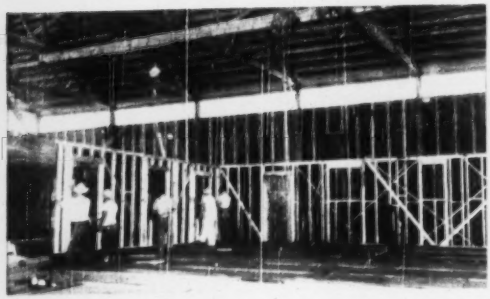
The [illegible] assembled by tack welding to [illegible] and then [illegible] with the flange plate [illegible] over the packing strip. Fig. 2. Two welders, opposite each other, work from the center of the member to the back step method, i.e., weld one, miss one. The length of each unit is equivalent to the use of two electrodes. Instead of returning to the center and finishing the "misses" the member is turned over and clamped over the packing strip, the welders weld the second flange as the first, then return to the center and finish the "misses". The member is then again turned over and clamped down over the packing strip, and the weld on the first flange completed.

• **Savings by Welding.** Close study of design, contract bid prices and construction techniques during the development of Australia welded bridges revealed four main savings by welding. These were: Utilization of gusset sections to resist moments, better distribution of metal in compression members, elimination of notching for upper chords and end posts, and modification necessary for rivet holes in flanges of riveted girders.

An indication of the saving in all welded or shop welded field riveted against riveted construction may be gained by the result of alternative tenders for the Bert Bert welded truss bridge, designed by the author in these three types of construction. To obtain a fair comparison, all designs were made by the same engineer, the author.

The saving in weight of the all welded over that of the riveted [illegible] and in cost [illegible]. It may be mentioned here that the department's latest standard truss bridge, designed for Victorian loading H20-S16, shows a saving in weight in shop welded riveted construction of 17, over the [illegible] equivalent. The saving of rivet heads should exceed the saving in weight as it does not take into account the [illegible] welded members, owing to the advancement of welding methods in Australia.

The reasons, however, for the decision to adopt the shop welded field riveted construction were not all based on the following considerations. The department already has full facilities for all sections in the shop and most jobs to be fabricated in the shop. Experience indicates that assembly, the quality of field welding, due to adverse conditions, compares unfavorably with shop welding, but supervision of field welding is more economical than for riveting. Facilities to weld connections of large members without distortion present some difficulties in the field.



1 Wall panels swing into place as house construction gets under way in a Mobilhome factory assembly line.

2 Complete, with siding, inside finish and equipment, the house moves along over rollers to the end of the line.

Homes Roll off the Assembly Line

Assurance that home construction is the latest purchasing, building and merchandising system that is making a return, but for a large share of the small and medium home construction business. Working under a license arrangement with the parent concern, Mobilhome Corp. of America, Bakersfield, Calif., nine manufacturers in the United States have started setting the line in operation.

Economy in production is obtained by the same men doing the same job at the same place each day, by standardization of materials and by mass purchasing. These economies are established the cost of building the completed structures to the purchaser's lot.

According to the builders, greater economic advantages are being developed as experience and knowledge increase. These advantages are compounded by integrated group procurement, standardized plans, modernized accounting, package mortgaging of homes and the production of a packaged home.

The Mobilhome system, as the builders term it, embodies the mass production principles that have made the automobile industry famous. Such principles as work simplification, labor-saving and local jobber service to be established. Financing institutions, including FHA, have readily accepted the purchase contracts involved.

Several different floor plans of 1,000 sq ft. The range from a one bedroom home selling for $5,750 up to three bedroom homes with 1,344 sq ft of floor space costing $8,150. The prices do not include land, but do include foundations, sidewalk and driveway, gas and water connections.

• **Assembly line**—The assembly line is the heart of the entire system. On it there are about ten stations, at least four or five of which are under cover. By the time the home emerges onto the open air it is completely enclosed and may even have a heating unit upon it.

Each house is let at each station one working day. Thus, a six-stock house, a house is built in 2 weeks.

Engineered channels are mounted on parallel rollers set in concrete. At the first station at the assembly line, 2x12 floor joists, 16 in. apart, are laid across these channels. Diagonal reinforcing is effected by 14-in. wide steel straps nailed to the joists. Similar straps are also used in the walls.

Next step is to cover the entire floor with 3/8-in. hardwood flooring. In areas where the climate is colder than California, double flooring is used. The hardwood flooring is sanded on the spot and then covered with heavy kraft paper for the duration of the construction period.

At the No. 3 position pre-assembled walls and partitions are installed. These are built at the ends next to the assembly line and moved into place by an overhead crane.

At the same time the plumbing rough-in is installed and plumbing and wiring are roughed-in.

At Station No. 4 the roof trusses are placed. Plywood and composition roofing are installed at that station.

At Station No. 5 the house emerges into the open air. Here the exterior siding is applied. Windows are installed and the house is given a coat of paint.

At Station No. 6 the interior walls are finished and the ceiling is installed. Kitchen cabinets are installed at this station.

At Station No. 7 the floor coverings are laid, the interior trim is completed and the interior painting is finished.

At Station No. 8 the finishing touches are made. Electrical fixtures are installed, the heating unit is connected and the house is given a thorough cleaning.

• **Moving the house**—When a house is ready to go, the home moving subcontractor takes over. A low bed truck is coming ready to haul the new house to its permanent location. In some cases foundations are built at the truck can back between them. Then the house is raised on and after the truck pulls out the house is lowered on its piers.

Almost all the Mobilhome licensees have arranged home moving firms for the moving work. Such firms have equipment and know how and are thoroughly familiar with legal requirements pertaining to their business.

In Texas and California these licensees have located as much as 200 miles from their factories.

3 Truck trailers operated by professional movers transport the house to the purchaser's lot where . . .

4 Foundations have already been prepared. House is picked from trailer and lowered into place

purchased units for their field drilling crews have moved them to new locations one or more times with no apparent damage. From San Diego, Mobilhomes have been barged to Coronado Island.

Variation in hauling methods is reported in Sacramento, Calif., where there are many bridges in and around the city. A truck trailer unit has been developed with jacking equipment so that when the trailer approaches a bridge the house is jacked up so it will clear the bridge railing. On the other side it is lowered again to clear telephone wires, etc.

• **Subcontractors**—Much of the other construction work is also done on a subcontract basis. In this regard the Mobilhome assembly line operation is much like any general building contract. Subcontractors are commonly involved on the following work: electrical, plumbing, tile and linoleum, and painting.

Workmen are hired just as they are on a general building contract. The union agreements and wage rates that are prevalent in the area are observed by Mobilhome operations.

Workmen seem to prefer Mobilhome work. It is usually a lot more regular than run of the mill contracting job, and the work location is fixed. This helps reduce costs by assuring an experienced crew.

• **Preliminary planning**—Considerable study went into development of the home plans. For example, almost all lumber used comes from the supplier in precut standard lengths. This lets the job cutting be overseen and when it is done it is ready to be assembled next hour.

The originators of the Mobilhome system operated for more than two years before spending the first dollar. During this time and continuously since, the plans have been improved. Now the various floor plans offer effective use of materials and produce a livable, efficient home.

Structurally, these homes are stronger than the average small home, since some extra strength is built in to resist moving stresses.

Inspection of the building work is also facilitated. Inspectors can conveniently view the work at any stage of the assembly line process. The Mobilhome people report no building-code conflicts.

Many advantages obtain in favor of the purchaser of a Mobilhome produced home. For example, the purchaser can select his own color scheme. Further, there are several floor plans and many exteriors to choose from. By purchasing the lot separately, the purchaser is assured of the type neighborhood he wants. He will not have to move into an area of more, similar houses in a tract type development. Another advantage is that the house can be delivered in 2 weeks so there is no long waiting period. Of course, there may be a large backlog and the purchaser would have to wait his turn. However, if the backlog becomes large enough, a second assembly line can usually be installed.

On the part of the builder, one major advantage is that there is no tremendous investment in property. Under the typical home development, money is tied up in land for months or more before houses can be sold. Under the Mobilhome arrangement, a down payment is made when the house starts down the assembly line, the major portion is about

> "The Mobilhome program is developing under a system of construction contract almost peculiar to the construction of small dwellings within the next few years."
>
> Hugh Current, President
> Mobilhome Corp. of America

ship. Final payment either is collected through a financing arrangement made by the buyer of the home. This is over 2 weeks from the time the house starts down the line. Thus the builder gets his full investment back even before he has had to pay for materials, men and subcontractors.

The Mobilhome people estimate that it takes from 30 days to 6 months to set up a Mobilhome assembly line. To break even, sales should total about 250 homes a year. A maximum of 750 homes a year can be produced from one assembly line in a year.

• **Background**—The system was developed by Hugh Current, Bakersfield, Calif., contractor, over a period of several years. Current says that Mobilhome "has an advantage over other similar homes in the knowledge built up during the development period. This knowledge is part of the service rendered by the parent company under the franchise agreement."

Franchise terms are 5% payment at the time the plan is put into effect, plus 1% of gross sales. For the 5% the builder gets use of the company's patents, trade secrets, trade mark, continuing operational help in tooling and procurement assistance.

Under the scheme, franchises have been sold in many West Coast cities, particularly in California. There are several plants in Texas sponsored by the Tindell Lumber Co. In the Midwest, plants have been established in Milwaukee, Chicago, Gary, Minneapolis and St. Louis, so far.

Current hopes eventually to have 250 active franchises in existence.

Dealers in most of the country report light traffic in the form of the standard Mobilhome prevented by the foregoing. For example, in Milwaukee there is an entire assembly line under one roof. This permits full scale work throughout winter months. Most Milwaukee homes must have a basement, which requires most of the site work.

Air in Earthfills Assures Stability

E. R. Hallett
Los Angeles, Calif.

SPECTACULAR earthfill failures have been caused by too much water in the fill. But solid earthfill voids contain as well as water. Failure is not likely to result in a properly-constructed fill.

Moisture and air content can be controlled when a fill is placed. But addition of fill material increases the pressure on all the fill, air becomes absorbed in the water. This changes a well-made fill to a supersaturated condition—and failure may result. Charts to yield data that forecast this possibility have been developed by the author and are the subject of this article.

These charts were developed after a suggestion by R. R. Proctor and Loring E. Eaton of the Los Angeles Department of Water and Power. The author was employed as a field engineer on construction of the Baldwin Hills reservoir by the city. Construction of that earthfill was checked by the use of charts.

• **Moisture content important**—In constructing a rolled fill one of the most important factors is the moisture content of the soil being compacted. The purpose of compaction is to make the fill so dense that failure by water saturation or other causes is not likely. For a given soil and a given method of compaction, a particular moisture content (optimum moisture content) of the soil will result in the most dense fill.

Compaction curves are drawn to determine the optimum moisture content. Unit weight (lb per cu ft) for several samples with different moisture content is determined to draw the curve. In all probability no saturated samples will be used to prepare such a curve.

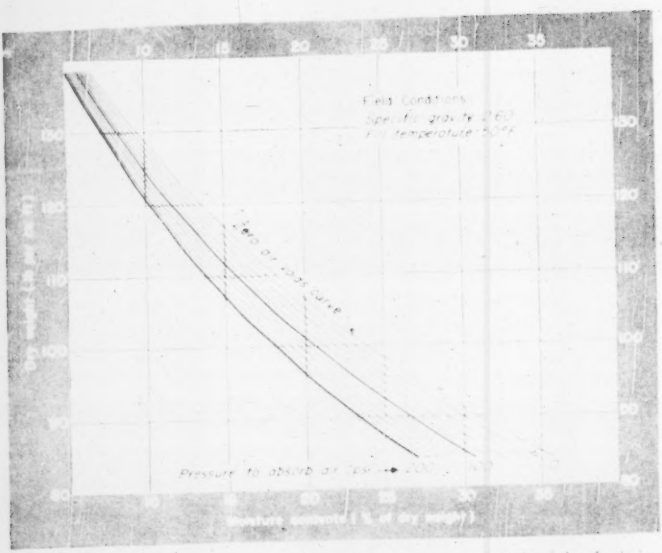
When a fill consolidates (by pressure) by adjusting to decrease the voids in the fill mass, air and water in the voids are put under higher and higher pressures. With the pressure increased, air is absorbed by water until a saturated condition exists. The possibility of the air escaping from the fill under pressure is neglected in this discussion. Such an omission will usually be on the safe side. Then, if the portion later loaded so as to decrease the voids, the entire additional load will be carried by the incompressible water, and the pore pressure may become very high. The friction of the soil may thus decrease until a slide-out failure of a slope occurs. The charts developed by the writer are intended to predict without calculation not how great is the possibility of such a failure.

As rolled fills are constructed, a large number of field samples are taken to show conditions in the fill. Engineers can judge what future procedural changes seem wise. Simple laboratory tests on the field samples will give moisture content, unit weight as found in the fill and the specific gravity of the soil particles. These values together with an estimate of the temperature of the completed fill are used in the accompanying charts.

• **Using the chart**—For each combination of specific gravity and fill temperature a separate chart is required. For example, if the specific gravity is 2.6 and the fill temperature is 50 deg F, the accompanying chart is used. The dry unit weight is plotted against moisture content. In most cases this point will fall within the group of curves plotted on the chart. For a 110-lb per cu ft sample with 17% moisture content, the plotted point falls on the third of the family of curves. This indicates that an additional pressure of 40 psi will be required fully to absorb existing air and react in a saturated condition.

For a field approximation, it may be assumed that increasing the height of a fill by 1 ft will increase the pressure by 1 psi. Thus, in the preceding example, an additional 40 ft depth of fill can safely be placed. But if more than 40 ft of fill is to be placed, a dangerous condition may develop. Here the part of the weight of the additional fill supported by the soil skeleton is neglected, thus being on the safe side.

To correct this condition the contractor may attempt to reduce the moisture content of the soil that is subsequently rolled. Note that a reduction from 17 to 13% in our previous example will permit pressure to be increased to 140 psi. If good compaction can be secured with a lower moisture content, then the extra fill may be permitted by the reduction. If good compaction cannot be obtained in the portion rolled at reduced moisture content, by reducing the moisture content, then the amount of additional



CHARTS such as this can be developed to predict pressure required to absorb air in a fill. This one is for a 2.6 specific gravity and a 50-F fill temperature.

Notes on Legal Decisions

Summaries of decisions relating to construction prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill).

Delayed Performance

It is generally held that a provision for liquidated damages for delay in the performance of a contract will be enforced provided the delay is not due, in whole or in part, to the fault of the party claiming the benefits of such provision. In other words, where delays are occasioned by mutual faults, the court will not ordinarily attempt to apportion the damages.

Speaking generally, the measure of damages in such cases is still reasonable compensation for the loss sustained. In looking contracts the loss resulting from delay in performance ordinarily is the rental value or the value to the use of the property, which varies according to the circumstances of each case. In such damages are sought in actions on contract, the contract may contain a provision fixing a standard which must be met to establish performance or to entitle the owner to recover damages in the event of a breach.

Architect's Compensation

An architect employed to prepare plans and specifications for a building, which he knows the owner intends to erect, is not entitled to compensation for his services if, through his own fault, he prepares plans which are unsatisfactory to the owner, or which are not adapted to the purpose for which they are intended, or which are not in accordance with the requirements of the law, but through no fault of the owner, he is entitled to compensation for his services, although the building is not erected.

Where an architect is employed to prepare plans for a building that is not to cost more than a specified amount, it has usually been held that the architect is not entitled to compensation unless the building can be constructed within the stipulated amount. However, where the architect merely gives an estimate of cost he will not be denied compensation because the cost of erecting the building for which he was engaged to prepare plans will entail an expenditure beyond the amount which he estimated would be required.

Cost Plus Contracts

In an action to recover a balance due on a cost plus contract, the contractor did not necessarily have to introduce in evidence his books to prove cost, but could show it by testimony based on his personal knowledge and memoranda.

Substantial Performance

The rule is of long standing that where a contractor or builder has in good faith endeavored to perform everything required of him under the terms of the contract, but has not absolutely performed everything, he is entitled to the contract price, less damages, if any, sustained by the owner because of the failure of the contractor to perform fully. Thus, where a contractor has substantially performed his contract, he is entitled to recover the contract price, less the amount of damages sustained by the owner because of the failure of the contractor to perform fully.

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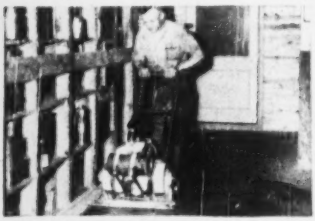

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DEVELOPMENTS ABROAD

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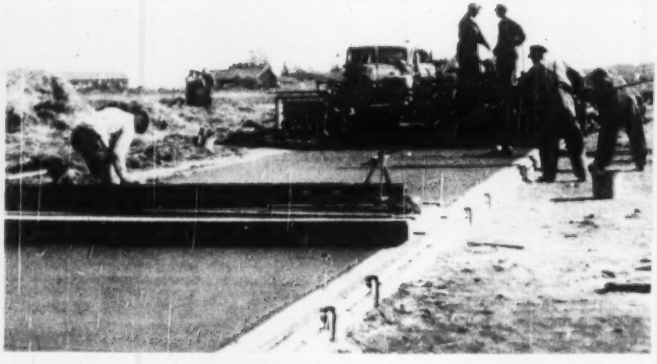


FOR SWEDISH JET FIGHTERS—Workers are shown doing hand finishing on the paving of a 6,500-ft. concrete runway at the private airfield of Svenska Aeroplan AB near Linkoping, Sweden. The concrete strip was necessary for the jet fighters now being turned out in quantity, and the 15-ton load of the company's Scandia transport. The runway is 135 ft. wide and 8 in. thick, on a bed of gravel and sand, with reinforcing mesh at slab joints only. The concrete contract is of Swedish construction, but American scrapers and tractors are used in the grading. The work is being carried out by AB Skanska Cementgjuteriet, leading Swedish contractor.

Power

Italy—Installation of a 50,000 kw turbo-generator set and related steam generators and accessories in a new plant to be built near Turin for Societa Idroelettrica Piemonte has been approved by the ECA. Local currency requirements for the project, which the company will meet through normal financial channels, are estimated at the equivalent of $4,134,000, plus $325,000 ocean freight, making a total overall equivalent cost of $10,674,000.

Colombia—It is said that, with its mountainous character and abundant rainfall, Colombia could have hydroelectric works with more than 50,000,000 hp., but at present it has only a fraction of that amount of power. However, five large hydroelectric works now under construction will double the country's present power capacity. Two of these works are enlargements of undertakings already in operation—Empresas Unidas de Energia Electrica, S.A., Bogota, and Empresas Municipales de Energia, Medellin.

The new enterprises are the Central de Anchicaya near Cali, capacity 70,000 kw; Central del Lebrija near Bucaramanga, capacity 18,000 kw; and Central de Caldas near Manizales, capacity 60,000 kw. They are being constructed by incorporated companies with participation by the government.

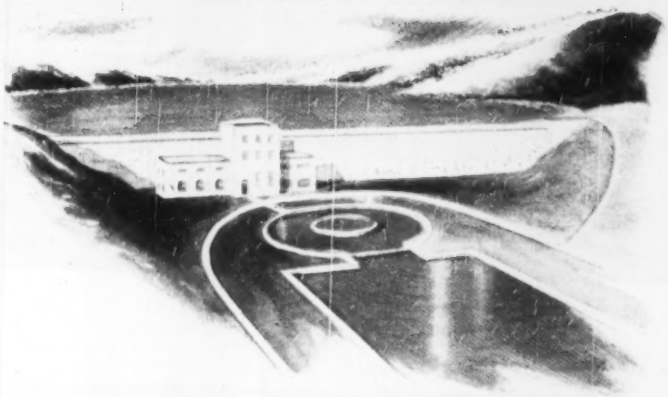
Cyprus—Government of Cyprus has engaged Sir Lindsay Parkinson & Co., Ltd., of London, and the Tilan Construction and Engineering Co. of Nicosia, Cyprus, to do the civil engineering and building work for a new power station at D'Helia, the first part of a project to supply electric power to almost the whole of the island.

Transport

Venezuela—The first part of the Avenida Bolivar to Caracas has been opened. Crossing the city through the middle, it is expected to do much to solve the capital city's serious traffic problem. It will be next year before the entire highway will be completed.

The Caracas-LaGuaira motor road project got under way officially last month and is expected to be completed within a little more than two years, at a cost of $30,000,000.

By the present road, which has 250 curves, it takes about an hour to drive from Caracas to the port of LaGuaira. When the new road is built, the trip will be only 20 minutes long—a saving of 40 minutes.



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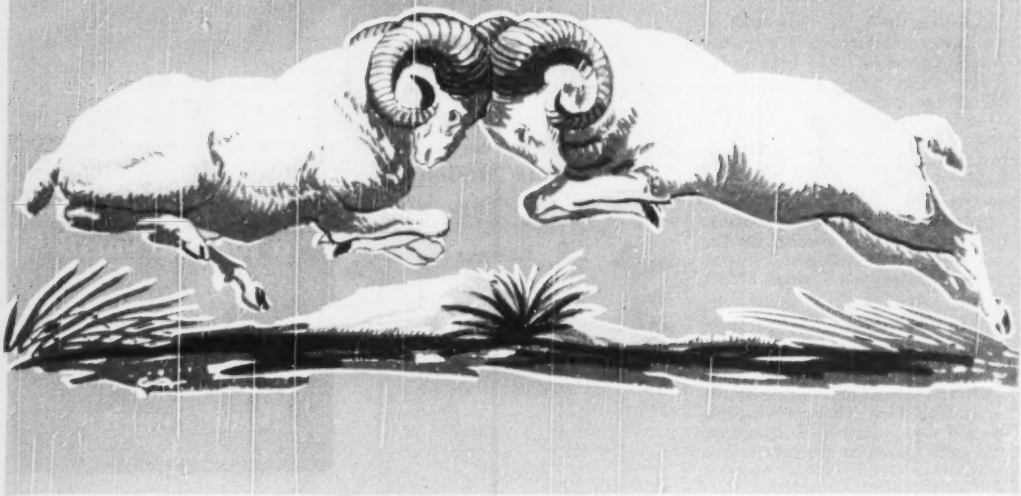
SHOCK STRENGTH



Without shock strength—or, for that matter—without all of the strength factors listed opposite—no pipe laid 100 years ago in *city streets* would be in service today. But, in spite of the evolution of traffic from horse-drawn vehicles to heavy trucks and buses—and today's vast complexity of subway and underground utility services—cast iron gas and water mains, laid over a century ago, are serving in the streets of more than 30 cities in the United States and Canada.

Such service records prove that cast iron pipe combines all the strength factors of long life with ample margins of safety. No pipe that is provably deficient in any of these strength factors should ever be laid in city streets. Cast Iron Pipe Research Association. Thos. F. Wolfe, Engineer, 122 So. Michigan Ave., Chicago 3.

CAST IRON PIPE

Strength factors of Long Life !

No pipe that is provably deficient in any of these strength factors should ever be laid in city streets

SHOCK STRENGTH

The toughness of cast iron pipe which enables it to withstand impact and traffic shocks, as well as the hazards in handling, is demonstrated by the Impact Test. While under hydrostatic pressure and the heavy blows from a 50 pound hammer, standard 6-inch cast iron pipe does not crack until the hammer is dropped 6 times *on the same spot* from progressively increased heights of 6 inches.

CRUSHING STRENGTH

The ability of cast iron pipe to withstand external loads imposed by heavy fill and unusual traffic loads is proved by the Ring Compression Test. Standard 6-inch cast iron pipe withstands a crushing weight of more than 14,000 lbs. per foot.

BEAM STRENGTH

When cast iron pipe is subjected to beam stress caused by soil settlement, or disturbance of soil by other utilities, or resting on an obstruction, tests prove that standard 6-inch cast iron pipe in 10-foot span sustains a load of 15,000 lbs.

BURSTING STRENGTH

In full length bursting tests standard 6-inch cast iron pipe withstands more than 2500 lbs. per square inch internal hydrostatic pressure, which proves ample ability to resist water-hammer or unusual working pressures.

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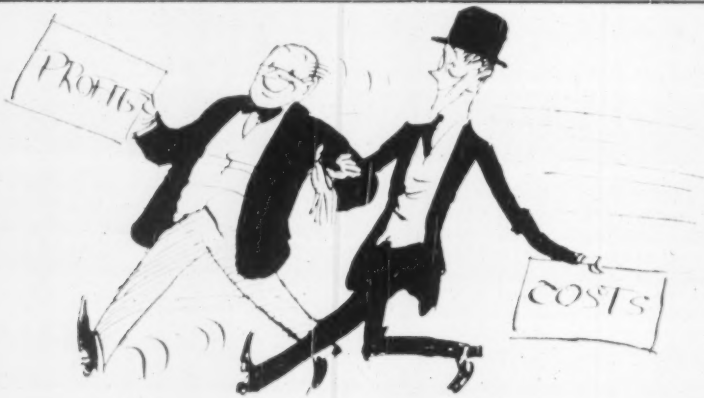

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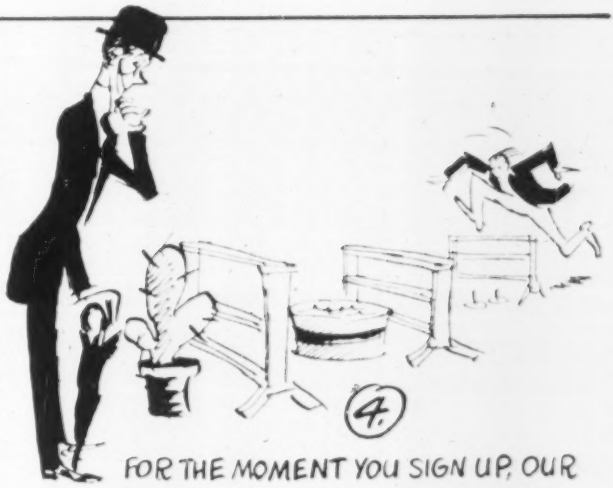

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MUNICIPAL AFFAIRS

Sewage disposal projects and anti-pollution work

Typical of many activities in the sewage treatment and anti-pollution fields are these recent items from five widely separated communities:

Kansas—All cities and towns in the Kaw River basin which are not providing minimum sewage treatment for city and industrial waste must produce plans for the construction of adequate equipment by Jan. 1, 1952, the Kansas board of Health has ruled.

San Bernardino, Calif.—Plans for nearly seven miles of new trunk sewer lines, a $515,000 intercepting system, have been approved by the city council. R. D. Forsythe, acting city engineer, said the improvement was needed to relieve the load on the present sewer system, which he said was now being used nearly to capacity. The project had been approved previously by the state, which will finance half the construction cost. The other half will be paid from the city's postwar development fund.

Norwich, Conn.—The Connecticut State Water Commission has given Norwich a three month's extension in which to advertise for bids for construction of a $1,750,000 sewage disposal plant, including a refuse incinerator. It is the second time dates have been extended by the commission for this project, planned for elimination of pollution of the Thames and Shetucket rivers.

Detroit, Mich.—The Michigan Water Resources Commission says that Detroit must build a sewage treatment plant at the outlet of Conners Creek within five years to avoid pollution of the Detroit River.

Vancouver, B. C.—The Vancouver and Districts Joint Sewerage and Drainage Board has appointed A. M. Rawn, Los Angeles, Calif., Charles G. Hyde, Berkeley, Calif., and E. A. Cleveland, Vancouver, to review the system of trunk sewers, interceptors and sewage disposal facilities in and around the Burrard Peninsula. One purpose of the consultants' survey is to encourage all municipalities adjacent to the waters of the peninsula from the Pitt River to the Strait of Georgia to plan sewage disposal facilities in advance of growing requirements.

Water Purification—Columbus, Ohio, city council has decided to submit an $8,000,000 general obligation bond issue to voters next November, to finance Hoover Dam on Big Walnut

Creek, and in the meantime, plans to issue $2,000,000 worth of bonds inside the 10-mill limitation to begin work on a Bethel Road project, an integral part of the Big Walnut project. While Hoover Dam and accompanying facilities will not be ready for five years, the Bethel Road plant can be finished within a year.

Erie railroad relocation at Corning, N. Y., to start soon

Work will begin soon in Corning, N. Y., on the Erie Railroad relocation, the most costly single project ever advanced by the New York State Department of Public Works.

The department expects to have the project completed by Dec. 1, 1952. Cost will be more than $10,000,000, including $2,148,934 in work to be performed by the three railroads concerned—the Erie, New York Central and Delaware, Lackawanna and Western.

The railroads will handle track installation, detours, buildings, signals, communication lines, and other construction in the actual railroad operation, and will be reimbursed by the state.

The new work will eliminate all crossings at grade with the D. L. and W. R. R., 6.89 miles of which will be moved to a new improved location on the easterly side of the Chemung River and outside the more densely settled sections of the city.

The tracks and various connections for the new Erie Railroad location at Corning, throughout its entire length of approximately seven miles, will be carried on an earth embankment, the material for which will be obtained from the widening and deepening of the Chemung and Tioga rivers, and from excavation of street depressions.

To carry the embankment over the various streams and streets, a total of 22 bridges will be built, most of which will carry the railroad over local streets. None will be multiple-span, the longest of which will be about 685 ft.

All tracks except those required to serve local industry will be removed from the streets of Corning. At present, tracks parallel Market Street, the main thoroughfare, and the passing of trains sometimes holds up traffic for a distance as far as ten blocks.

Milwaukee expressways

City officials of Milwaukee, Wis., led by Mayor Zeidler are asking the common council for speedy approval of a $250,000 appropriation to hire consulting engineers for expressways

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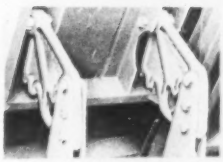

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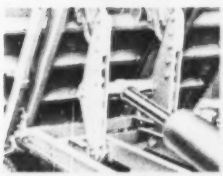

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planning. It is hoped to sign contracts soon for plans for the 44th St. expressway and the first leg of the east-west route. The desire is to start work on the 44th St. artery this summer.

Municipal Briefs

Pure Water for Richmond—A new $2,000,000 James River water purification plant for Richmond, Va., was dedicated recently. Its cost will be paid from revenues and will not affect the water rate or city taxes.

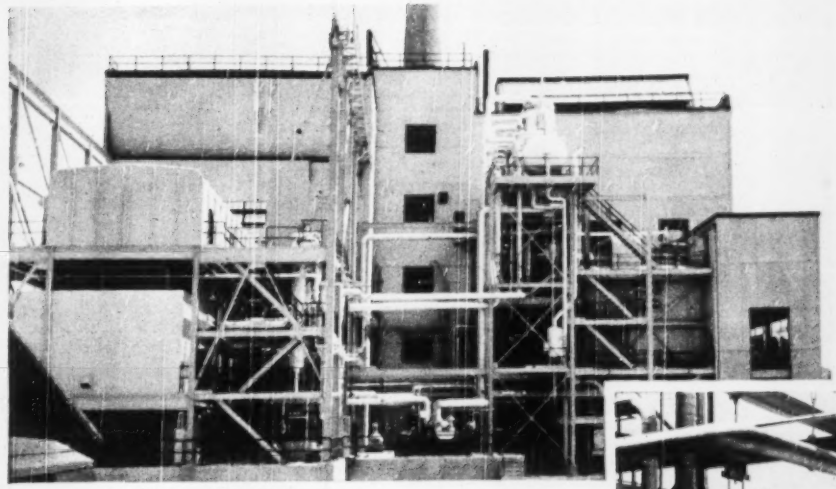
Parking plans—At Jacksonville, Fla., three off-street parking plans are being considered. Mayor Haydon Burns has a plan for eight perimeter parking lots to be operated by a municipal parking authority; a downtown waterfront parking project has been proposed by the city, county and schools improvement committees; and there is also a proposal for an underground parking garage beneath Hemming Park.

To help Buffalo traffic—It is expected the construction of the $8,500,000 high level bridge over the Buffalo River to combine a network of traffic-easing arterial highways in Buffalo, N.Y., will be started this spring. It will provide a route for a smooth flow of traffic into and out of the city from the southeast. The State Department of Public Works plans to let contracts for the project in May.

Ft. Lauderdale tunnels OK'd—Commissioners of Broward County, Fla., have approved the entire $15,000,000 proposition offered by the state road department to construct three tunnels in Fort Lauderdale and drawbridges in six communities of the county. The proposal calls for toll revenue bonds of $13,000,000 and a $2,000,000 federal aid grant. Included also would be a 50-year share of county gas tax funds.

City planning commission—The city council of Lebanon, Ind., has approved the establishment of a city planning commission to be composed of three city officials to be appointed by the council and four other citizens to be named by the mayor.

Arterial highway proposed—The Syracuse, N.Y., City Planning Commission has approved a resolution favoring state plans for transforming Oswego Boulevard into an arterial highway, although City Engineer Nelson P. Pitts dissented. The limited-access highway has been estimated to cost between $3,000,000 and $5,000,000 of assessed prices.



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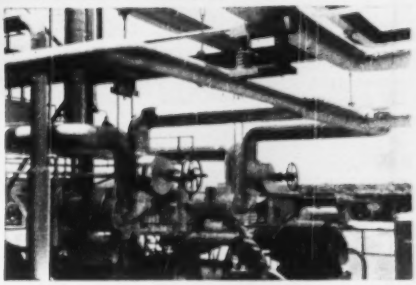

El Paso Electric Company efficiently conserves heat with K&M INSULATIONS

IN 1948, the El Paso Electric Company extended its Rio Grande Power Station to add 20,000 Kilowatts to the existing plant's 46,000 Kilowatt capacity. Boilers, piping, and other heated surfaces were insulated with K&M "Featherweight" 85% Magnesia for temperatures up to 600° F., and with K&M Hy-Temp Combination for temperatures in excess of 600° F.

K&M "FEATHERWEIGHT" 85% MAGNESIA

for temperatures to 600 F.

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K&M HY-TEMP COMBINATION

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MEN AND JOBS

Among recent changes in the Pennsylvania department of highways are the following: **N. A. Staples**, District 5 engineer at Harrisburg, becomes assistant chief engineer in charge of maintenance, succeeding **Warren K. Myers**. Retired. **Owen C. Beckley**, assistant chief maintenance engineer, **James I. Hand**, assistant district engineer at Uniontown, **H. L. Worst**, district maintenance engineer at Williamsport, **V. J. Bedard**, district engineer at Harrisburg, **Morris S. Brumbaugh**, maintenance superintendent in Lackawanna County, **Gilbert H. Seigworth**, maintenance superintendent, Tioga County, and **Geo. W. Kline**, acting maintenance superintendent, Somerset County.

Vaughn Downs has been transferred by the Bureau of Reclamation from Coulee Dam to Ephrata, Wash., as chief of the field engineering subdivision of the Columbia Basin Project's irrigation district. He has been construction engineer in the Coulee Dam division of the project. In his new assignment, Downs will be responsible for the location of hundreds of miles of lateral canals and the layout of farm units in connection with the irrigation of thousands of acres in the project, which will begin to get water in 1952.

Col. Wm. P. Cornelius has been appointed manager of the new district office at 2121 Commerce Building, Houston, Tex., of Giffels & Vallet, Inc., and L. Rossetti Associated Engineers and Architects, of Detroit, Mich. Colonel Cornelius had been at Richland, Wash., where he was chief of the construction and maintenance division of the Hanford Atomic Energy project. Giffels & Vallet, Inc., were the engineers on the design of two of the major projects at Hanford Works. They are also engineers for the current Atomic Energy developments at Oak Ridge, Tenn., on which Col. Cornelius was construction chief from 1945 to 1946.

Charles L. Noe, formerly with Jones, Henry & Schoonmaker, Toledo, Ohio, consulting engineers, has been appointed construction supervisor of the Toledo Board of Education's building and modernization program.

John Leslie Rannie, former chairman of the Ottawa Branch of the Engineering Institute of Canada and associated with the Department of Mines and Technical Surveys, has been appointed to be Canadian secretary of the International Boundary Commission.

Walter H. Cotton, British Columbia public works engineer in the Fernie district for seven years, has been transferred to Vancouver. He will retire later this year.

Albert L. Guckert, Columbus, Ohio, director of the Southern Ohio district office of the Federal Housing Administration, who has approved applications of insured loans on housing in central and southern Ohio in the last 15 years, will retire next February.

John Alfred Wahl has joined the firm of Kelly & Gruzen, architects-engineers, New York, N. Y., and Jersey City and Newark, N. J., as office and production manager. Mr. Wahl was formerly assistant in charge of projects in Irwin Chanin, architect for the Board of Design of the Metropolitan Life Insurance Co., on the Stuyvesant Town, Peter Cooper and Riverton Housing projects, recently with W. Stuart Thompson and Phelps Barnum, architects.

M. J. Hoffman, Minnesota state highway commissioner, at right, receives the George S. Bartlett Award from Enoch R. Needles, consulting engineer, New York City, recently elected to a second term as president of the American Road Builders Association. The award, made each year by ARBA for "outstanding contribution to highway progress."

Rear Adm. Carl A. Trexel, CEC USN, right, was snapped at the San Francisco AGC convention with his successor and with one of his new bosses. Rear Adm. Lewis N. Moeller, CEC USN, left, succeeded him as director of the Pacific and Alaskan divisions of the Bureau of Yards & Docks on Admiral Trexel's retirement April 1. George Lootz, center, is general manager of Stolte, Inc., Oakland, Calif., contractors, who with Ben C. Gerwick, Inc., San Francisco, Calif., contractors, jointly sponsor International Marine Platform Constructors, of which Admiral Trexel is the new executive manager.

Col. E. M. Albrecht has relieved Col. J. S. Seybold as district engineer of the Garrison district, Corps of Engineers. He was Fourth Army Engineer at Fort Sam Houston, Tex., prior to assuming his new assignment. A 1923 graduate of the United States Military Academy, Colonel Albrecht was also graduated from Cornell University school of engineering in 1926. He was assistant to the district engineer in the St. Paul district from 1934 to 1938, working mostly on the canalization of the Mississippi River. During the war he was in charge of Army construction in England. On the continent he served as deputy chief engineer of the European Theater of Operations and was on the ETO General Staff.

W. Floyd Flenderer, formerly Bucyrus, Ohio, service director for six years, and former Crawford County deputy engineer, has been appointed resident engineer of the Ohio Highway Department for the $27-mile North Sandusky Ave. bridge and street widening project in Bucyrus.

Pennsylvania Department of Health has announced the appointment of John V. Covne, Langhorne, as senior assistant sanitary engineer, and at the same time reported the withdrawal of Paul W. Weister, of Philadelphia, from a similar post.

Merle W. Hemphill has become deputy director of the Office of Airports, Civil Aeronautics Authority, under Fletcher Meade, director. Prior to joining CAA, Hemphill served four years with the Aviation division of the Navy Bureau of Yards and Docks, and before that was with the bridge division of the Vermont state highway department. He is a civil engineering graduate of the University of Vermont (1935).

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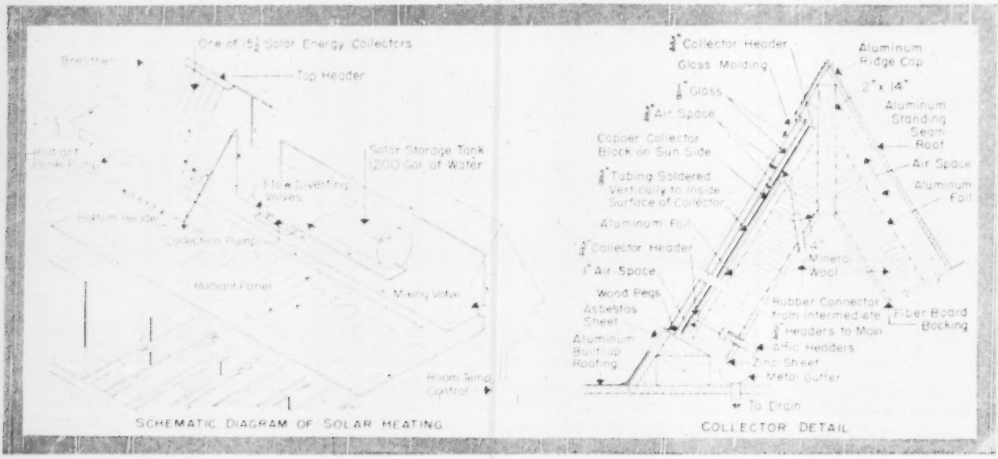

SOLAR HEATING of the MIT house is accomplished with a collector in the roof that warms water for panel heating

Expect full report soon on MIT's sun-heated house

The first complete report on the operation of the Massachusetts Institute of Technology's solar-heated house will be presented this summer to members of a course symposium on Space Heating with Solar Energy.

According to the solar energy conversion committee, the full report will prove the prediction that a 10 percent annual fuel heating house is possible in the Boston area "without any construction cost."

Tentative heating data that during the first three months of the heating season the plate collector on the house supplied 12 percent of the heat.

In that period slightly more than half of the total heat requirement was met by the solar energy collector. An additional 10 percent came from the "free" heat given off by the lights, people and appliances in the house.

The solar energy collector is a flat plate type, 5½ ft by 16 ft, mounted on the south roof of the house at a 60 deg angle. Water is circulated through the collector and stored in a 1,000 gal tank. A 75 ft long coil of 2¼ in. pipe is immersed in the water in the storage tank.

Heat is transferred from the water in the storage tank to the house by means of a heating coil in the air duct of the forced air heating system. Auxiliary heat is supplied by an oil burner.

Two layers of glass are used in the collector to reduce heat loss. Behind the glass is a copper plate with copper tubing soldered to it. Water is circulated through the tubing and picks up heat from the plate.

The collector is tilted at an angle of 60 deg from the horizontal to receive the maximum amount of heat from the sun during the winter months when heating is required. In the summer months the collector is tilted at an angle of 30 deg from the horizontal to receive the maximum amount of heat from the sun.

The collector is protected from the weather by a double layer of glass

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SHONE® PNEUMATIC EJECTORS

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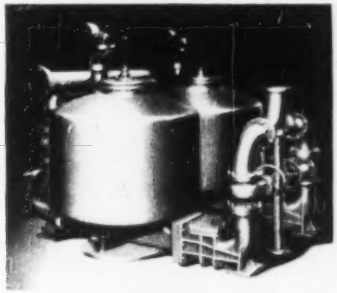

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- no noxious fumes or odors
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For 75 years, in hundreds of municipal installations around the world, Shone Pneumatic Ejectors have been a symbol of utter dependability.

You may have heard the amazing story of the Shone Ejector sealed in its pit for more than 20 years—never inspected because it was not listed among mechanical equipment, rediscovered when alteration work opened the pit—operating as rhythmically and quietly as the day it was installed.

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Los Angeles, Calif., Hyperion Treatment Plant (2)
Campus, University of Washington, Seattle (2)
Chicago, Ill., West Side Subway Extension (22)
Osceola, Iowa
Mt. Clemens, Mich.
Freeport, L. I., New York (6)
Fort Washington, L. I., New York (2)
Moorehead, Minn., Treatment Plant (6)
Anacostia Treatment Plant, Washington, D. C.

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Pensacola, Fla.	Flint, Mich.	Dayton, O.
Silver Springs, Fla.	Pontiac, Mich.	Enid, Okla.
Dublin, Ga.	Royal Oak, Mich.	Tulsa, Okla.
LaPorte, Ind.	Tawas City, Mich.	Providence, R. I.
Wanatah, Ind.	Tunbridge, Mass.	Memphis, Tenn.
Cedar Rapids, Ia.	Alameda, Minn.	Austin, Tex.
Davenport, Ia.	Brookhaven, Miss.	Dallas, Tex.
Sioux City, Ia.	Butler, Mo.	Madison, Wis.
Hilo, Hawaii	Rollo, Mo.	Milwaukee, Wis.
Sioux, Kans.	Bloomfield, N.J.	Neenah, Wis.
Wichita, Kans.	Montclair, N. J.	Laramie, Wyo.
Aberdeen, Md.	Albany, N. Y.	
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MAJOR MEETINGS

Building Officials Conference of America, Minneapolis, Minn., June 5-8.

National Society of Professional Engineers, annual meeting, Hotel Statler, Boston, Mass., June 5-9.

Central States Sewage Works Association, Hotel Lincoln, Indianapolis, Ind., June 8-10.

Western Association of State Highway Officials, Mayor Hotel, Reno, Nev., June 8-10.

Pennsylvania Sewage Works School, [illegible], June 8-10.

American Congress on Surveying and Mapping, 10th anniversary meeting, Hotel Statler, Washington, D. C., June 8-13.

Pennsylvania Water Works School, [illegible], June 12-14.

Ohio Sewage & Industrial Wastes Treatment Conference, [illegible], June 13-14.

American Society of Civil Engineers, [illegible], June 14-16.

OBITUARY

Maj. Llewellyn Eustace Jones, USA Ret., 63, a consulting engineer and naval architect died May 5 at Philadelphia, Pa.

Norman Foster, 61, consulting civil engineer and partner in the Sloan Hill, Pa., firm of Damon and Foster, consulting civil engineers, died May 5 at Chester, Pa. The firm which serves as engineering consultants for 25 municipalities in the Philadelphia area was formed in 1922.

E. Paul Ford, 65, San Diego, Calif., civil engineer, died May 6. He had served as field engineer at Camp Kearny, supervision of the enlargement of Ft. Rosecrans, assistant engineer for the Missouri Pacific Railway, general superintendent for the building of Dalworth, Texas, city engineer of the municipality of East San Diego, and resident engineer for the San Diego Securities Co. He was a graduate of the University of Arkansas.

Joshua W. Kelley, 77, who had been in the city engineering department of Springfield, Ill., for 58 years, died there May 7.

Daniel C. Lacey, 67, an authority on municipal highways, died May 7 in Brookline, Mass. He was noted for efficient methods of snow removal and the system in established for that purpose was adopted in many other communities. He entered the Brookline highway department at an early age. He was a past president of the Massachusetts Highway Association.

James Philip McGuire, 43, president of the J. F. McGuire Construction Co., Durham, N. C., general contracting and road building firm, died May 13. A native of Syracuse, N. Y., and a graduate of Georgetown University, he entered the contracting business with his uncle, Frank J. McGuire, in Syracuse in 1922 and moved to Durham in 1924. In 1935 he formed the construction firm which began his career and which became one of the leading builders in North Carolina.

Stephen V. Power, 74, secretary of the Chicago Bridge & Iron Co. until his retirement in 1945, died in Chicago May 12. He had been employed by the company for 50 years.

H. J. Wernert, 67, Pacific Coast engineer for 25 years connected with the American Bridge Co., died in Long Beach, Calif., May 14. He had

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LEFAX, Dept. ER-4 Philadelphia 7, Pa.

been chief engineer of the Canton, Ohio, works of the company for a number of years.

Dean W. Martin, 62, civil engineer and retired Internal Revenue forestry engineer, died in Washington, D. C., May 10. Mr. Martin received an engineering degree from the University of Minnesota. He went to the Government Forest Service began as an exhibition engineer with the timber section of the Forest Lay Unit and later became chief of the section and in 1935 became chief of the appraisal section of the unit. He retired recently after 30 years service. During World War I, he served overseas with the Tenth Engineers.

Alfred C. Neuffer, 47, Navy Department civil engineer, died May 14 in Lynchburg, Va. Mr. Neuffer went to Washington six years ago. Until recently, he was a civil engineer attached to the Naval Air Testing Station at Patuxent River, Md. He attended Lewis Institute in Chicago and served in the Navy during World War I.

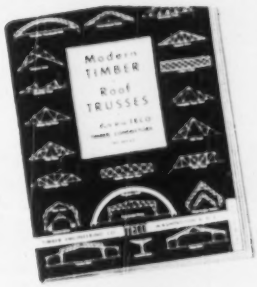
Jeremiah V. Sullivan, 61, president of Sullivan-Foster, Inc., New Bedford, Mass., general contractors, died on May 11 at that city. He joined the J. W. Bishop Co., Worcester, Mass., as a young man and later became president. After 43 years with the Bishop organization he organized Sullivan-Foster, Inc., in 1930.

John R. Sinclair, 67, former Union Oil Co. civil engineer, died May 4 in Los Angeles. A native of England and a graduate of Oxford, Sinclair came to the U. S. 35 years ago. During World War I he served with the Canadian Expeditionary Forces.

Earl Friend Stone, 56, resident engineer for the Nevada highway department, died recently at Cedar City, Utah, as a result of an automobile accident.

UNIT PRICES BID BY CONTRACTORS

Activated sludge plant in Tuscon, Arizona



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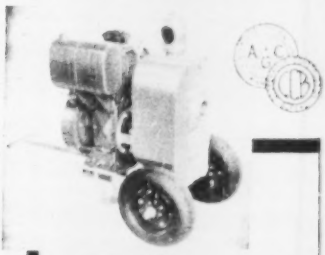

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager J. A. MAHONEY, Reports M. R. ROESSLER, Statistics

WATER SUPPLY

BRIDGES

SEWERS, WASTE DISPOSAL

STREETS AND ROADS

PROJECTS COVERED

Projects: By Size

Classes of Construction

Stages Reported

Symbols and Abbreviations Include:

+

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B.A.

ENR — News-Record

CD — News-Record Construction Daily

EARTHWORK, WATERWAYS

AIRPORTS

PUBLIC BUILDINGS

COMMERCIAL BUILDINGS

BIDS ASKED

500% LETS CONTRACT

LOW BIDDERS

CONTRACTS AWARDED

INDUSTRIAL BUILDINGS

BIDS ASKED

500% LETS CONTRACT

CONTRACTS AWARDED

Continued on page 703

"How do you like your 3 LINK-BELT SPEEDER Shovel-Cranes?"

I asked F. E. Young of San Diego,

and this is what he said:

"We keep our three Link-Belt Speeders* busy on a variety of contract projects almost continuously. I like their production records, their downright dependability—the way they take the abuse of a rough schedule. And when necessary, we always get prompt attention from your distributor, Shaw Sales and Service Co.

"Our operators show us that Link-Belt Speeders have lots of power and speed. Our K-360 operator raves about the easy Speed-o-Matic hydraulic controls. He soon learned that the Independent Chain Crowd is a great feature and that no cable breakage reduces down time.

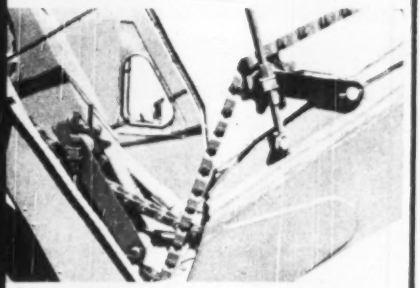
"And our superintendent, R. E. Morriss, just says that anyone of our Link-Belt Speeder Shovel-Cranes is a good rig on any job.

"Do you want more details?" he asked.

"No thanks," I replied. "I have my story."

*A Model K-360, 1½ yd. shovel, with trench hoe and dragline attachments, a Model 75 shovel and trench hoe, a Model HC-70 truck mounted Shovel-Crane.

Editor's note on the Chain Crowd



The positive Independent Chain Crowd mentioned by Mr. Young is an outstanding feature of Link-Belt Speeder Shovels. It is self-adjusting to all boom angles . . . The chain crowd and retract action is controlled by one lever . . . This positive Independent Chain Drive assures fast, accurate positioning of the dipper.

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LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA

Builders of the Most Complete Line of SHOVELS-CRANES-DRAGLINES

11,102

(Continued from page 68)

UNCLASSIFIED

BIDS ASKED

PROPOSED PROJECTS

WATER SUPPLY

SEWERS, WASTE DISPOSAL

BRIDGES

STREETS AND ROADS

EARTHWORK, WATERWAYS

AIRPORTS

LATIN AMERICA

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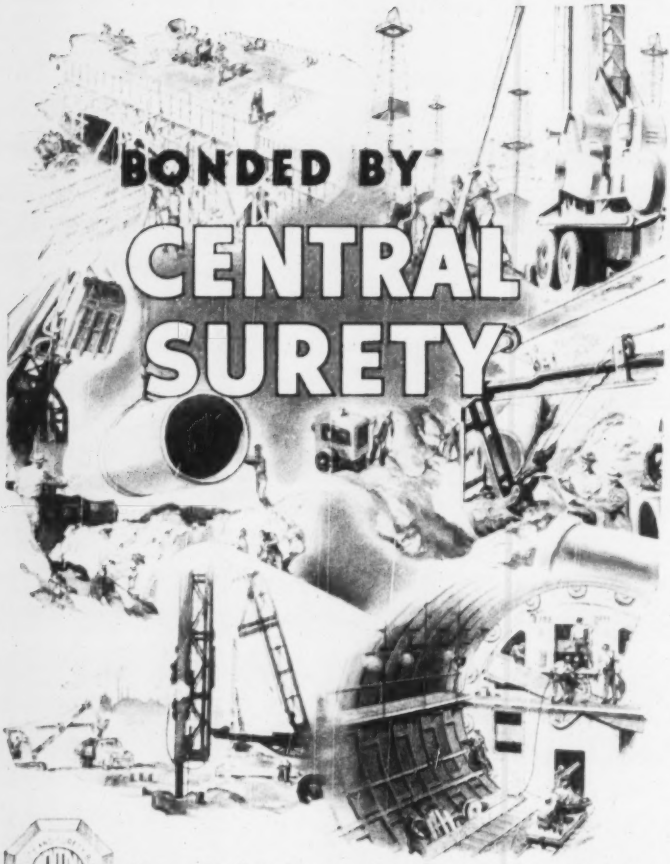

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CONSTRUCTION REPORTS-Second Section

WATER SUPPLY

STREETS AND ROADS

BRIDGES

SEWERS, WASTE DISPOSAL

EARTHWORK, WATERWAYS

BIDS ASKED

CONTRACTS AWARDED

AIRPORTS

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U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR Bureau of Reclamation Sealed bids (Specifications No. 2967) will be received by Bureau of Reclamation, Tracy, California, June 21, 1950, and then publicly opened for furnishing labor and materials and performing all work for the installation of earthwork and structures, Station 4+42 to Station 627+24, San Luis wasteway and holding reservoir, Delta-Mendota Canal, Central Valley Project, California. The work is situated near Volta, California. Principal items are approximately 3,200,000 cu. yds. excavation, 1,000,000 cu. yds. construction of reservoir dike, 5,100 cu. yds. concrete, 27,000 lbs. structural steel, gates and metalwork and other work. The work is divided into 4 schedules. Time allowed for completion will be 625 days. For particulars address Bureau of Reclamation, Tracy, California, or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.

(7589)

UNITED STATES DEPARTMENT OF THE INTERIOR Bureau of Reclamation Sealed bids (Specifications No. 2956) will be received by Bureau of Reclamation, Friant, California, June 20, 1950, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork, concrete lining and structures, Station 6941+00 to Station 8201+20.0, Friant-Kern Canal, Central Valley Project, California. The work is situated from about 22 miles northwest to about 4 miles west of Bakersfield, California. Principal items are approximately 2,894,240 cu. yds. excavation for canal, 91,340 cu. yds. excavation for canal lining, 18,200 cu. yds. concrete in structures, 142,000 lbs. furnishing and handling cement, 1,271,000 lbs. furnishing and placing reinforcement bars, and other work. Time allowed for completion will be 700 days. For particulars address Bureau of Reclamation, Friant, California, or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.

(7587)

MISSOURI RIVER BASIN PROJECT, Boysen Dam and Reservoir, Wyoming, May 15, 1950. Specification WY-1922-50(C)18. NOTICE IS HEREBY GIVEN that sealed bids or proposals for Specification No. WY-1922-50(C)18 will be received at the Office, Upper Missouri Region, Bureau of Reclamation, Casper, Wyoming, until 2:00 P.M., (M.S.T.), June 15, 1950, and then publicly opened for furnishing prefabricated building for Garage and Machine Shop at Recreation Center near Casper, Wyoming, Missouri River Basin Project, Wyoming. Copies of the standard form and of the specifications may be obtained from the following offices: Regional Director, Bureau of Reclamation, Denver, Colorado; and J. J. Matthews, District Manager, P.O. Box 2551, Casper, Wyoming. Attention is called to the fact that the specifications call for the payment of not less than the minimum wage rates as determined by the Secretary of Labor, and other requirements. Bidder must submit with his bid a bond or certified check in the amount of 20 percent of the bid. The right is reserved to reject any or all bids.

A. A. Batch, Regional Director.
Concurrence: Oscar S. Stauffer, Director, and J. J. Matthews, District Manager, May 25, 1950.
Upper Missouri Region, Casper, Wyoming.

(7582)

OFFICIAL PROPOSALS

Water Supply

Sealed proposals for furnishing equipment and constructing a Water Supply System will be received by the Village Board of the Village of Newark, at their office in the Village Hall, Newark, N. Y., until 8:00 P.M. (DST) on the 13th day of June, 1950.

Information for bidders can be obtained at the office of the Village Clerk, Newark, New York, and at the office of William S. Lozier, Consulting Engineers, 10 Gibbs Street, Rochester, New York. Copies of plans may be obtained upon the payment of twenty-five dollars ($25.00) for each set, which will not be refunded.

The work consists of the construction of an intake structure and submarine pipeline in Canandaigua Lake, approximately 21 miles of 24", 20" and 16" water mains and appurtenances between Canandaigua Lake and the existing reservoir near Newark; a slow sand filtration plant; a control and chlorination house; valve vaults at the reservoir; connections to existing facilities and the separate furnishing of pipe materials for portions of above work.

A. J. Deal,
Village Clerk,
Newark, New York

Dated: June 1, 1950

(7585)

Bids: June 15, 1950

Additions to Disposal Plant

Sealed proposals for furnishing equipment and certain other materials to be used in the construction of the Additions to Allen Creek Treatment Plant of Brighton Sewer District No. 2 will be received by the Board of Sewer Commissioners at their office in Gibbs Street, Rochester, N. Y., until 2:00 o'clock P.M. (DST) on the 13th day of June, 1950.

Information for bidders can be obtained at the office of William S. Lozier Company, Engineers, 10 Gibbs Street, Rochester, N. Y.

BOARD OF SEWER COMMISSIONERS
BRIGHTON SEWER DISTRICT NO. 2
Thomas Merbitz,
Harold V. Madigan,
G. Albert Sproat,

May 17, 1950

Bids: July 11, 1950

(7710)

Sewage Treatment Plant

BETHLEHEM, PA.
NOTICE TO BIDDERS
GENERAL CONSTRUCTION

Contract No. 1

Sealed proposals addressed to the Bethlehem Authority of the City of Bethlehem, Pa. for General Construction of a Sewage Treatment Plant, will be received at the office of the Bethlehem Authority, 25 N. New St., Bethlehem, Pa. until 11:00 A.M. (E.S.T.) on the 11th day of July, 1950, at which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bonds are on file and may be examined at the office of the Bethlehem Authority, 25 N. New St., Bethlehem, Pa. Bidders may obtain a set of plans and specifications upon payment of $10.00 which amount will be returned if bid is submitted and the plans returned in good condition within two weeks of the opening of bids by the Authority.

A certified check in the amount of 10% of the bid must accompany each bid as a guarantee that the bidder will enter into a contract and furnish bonds as required. Bonds will be required for 100% of the contract price.

The Authority reserves the right to reject any or all bids and to waive any informalities in the bidding.

Labor and Materialmen's Bond in an amount equal to 50 per cent of the total of the bid submitted.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. Coyle, Chairman
Robert L. Fox
Executive Director

Bids: May 17, 1950

(7590)

Greenville-Lake Village Bridge Over the Mississippi River

CITY OF GREENVILLE, MISSISSIPPI

1. Sealed bids for altering the roadway floor and making certain additions to a portion of the above named bridge, to provide for the installation by others of 4-2" gas pipe lines, will be received by the City council, Greenville, Mississippi, at the office of the mayor in the city hall, Greenville, Mississippi, until 10:00 A.M. C.S.T., June 9, 1950, and then will be publicly opened and read.

2. The work for which bids are requested includes removal of the present reinforced concrete roadway slab on a portion of the bridge and its replacement with a lighter weight steel armored floor, modification of supporting metalwork and of curbs, and removal of structural supports for pipelines now on the bridge and installation of new structural supports for pipelines. Pipelines now on the bridge will be removed and the new pipe lines and their appurtenances will be installed by others.

3. Each bid shall be accompanied by an acceptable bid bond or certified check in an amount not less than five per cent of the total amount of the proposal. Bids and bid bonds may be held for a period of not more than thirty days from the date of opening thereafter, bid bonds will be returned to bidders not awarded contracts.

4. All work except painting is to be completed in not more than 150 calendar days, painting is to be completed 30 calendar days thereafter. Bonus payments for early completion of the work will be made. Delayed completion shall be compensated by assessment of liquidated damages. Performance bond will be required.

5. Copies of plans and specifications are on file and may be examined at the office of the City Clerk, Greenville, Mississippi, and at the office of the engineer, Howard, Needles, Tammen & Bergendoff, consulting engineers, 221 Walnut street, Kansas City, Missouri. Prospective bidders will be supplied two sets of plans and two copies of the specifications upon depositing $25.00 with the engineer, of which $15.00 will be refunded upon return of the plans in good condition. Proposals of the prime will be printed with the plans and the printing company from whom any prospective bidder who has made the deposit above stipulated may purchase as many additional blue print copies of any or all sheets of the drawings as he may desire. Prospective bidders may secure extra copies of the specifications from the engineer at $2.00 per copy.

6. The City Council of Greenville reserves the right to reject any or all bids and to waive any informalities in the bidding.

CITY OF GREENVILLE,
MISSISSIPPI
W. B. Williamson,
City Clerk

(Continued on page 79)

READ THE OFFICIAL PROPOSAL COLUMNS OF ENGINEERING NEWS-RECORD THIS WEEK AND EVERY WEEK

OFFICIAL PROPOSALS

(Continued from page 78)

Bids June 22, 1950 (2274)

Water Distribution & Sanitary Sewerage System & Plant

Sealed proposals will be received by the Hanover Municipal Authority, at the Water Treasurer's office, 44 Frederick Street, Hanover, Pa., until 8 P.M. (Eastern Daylight Saving Time) on June 22, 1950, and will be publicly opened and read aloud for the Construction of Water Distribution System and New Sewerage System and New Sewage Treatment Plant, as per specifications prepared by Gannett, Fleming, Corddry & Carpenter, Inc., Consulting Engineers, Harrisburg, Pa., copies of which may be obtained from the Authority's Engineers, 1 North Second Street, Harrisburg, Pa., upon deposit of $25.00 for each set of plans and specifications. The deposit will be refunded if the plans and specifications are returned within ten days after the opening of bids in good condition. If the plans and specifications are not returned within the time stated, the amount of the deposit will be retained by the Authority. Each bid must be accompanied by a certified check, bank draft or cash bond in the amount of 10% of the bid, made payable to the Hanover Municipal Authority, as a guarantee that the bidder will enter into a contract and furnish bonds as required within ten days after the award of contract. The Hanover Water Authority reserves the right to reject any or all bids or to waive any informality in the bidding.

By order of the Hanover Municipal Authority
Hanover Water Department
Hanover, Pennsylvania

Bids July 11, 1950 (2278)

Plumbing

BETHLEHEM, PA.

NOTICE TO BIDDERS

Sealed proposals will be received by the Bethlehem Authority at the office of the Authority, 10 East Church Street, Bethlehem, Pa., until 11 A.M. (Daylight Saving Time) on July 11, 1950, and will be publicly opened and read aloud for the Plumbing of the Water Treatment Plant, as per specifications prepared by Gannett, Fleming, Corddry & Carpenter, Inc., Consulting Engineers, Harrisburg, Pa., copies of which may be obtained from the Authority's Engineers, 1 North Second Street, Harrisburg, Pa., upon deposit of $25.00 for each set of plans and specifications. The deposit will be refunded if the plans and specifications are returned within ten days after the opening of bids in good condition. If the plans and specifications are not returned within the time stated, the amount of the deposit will be retained by the Authority. Each bid must be accompanied by a certified check, bank draft or cash bond in the amount of 10% of the bid, made payable to the Bethlehem Authority, as a guarantee that the bidder will enter into a contract and furnish bonds as required within ten days after the award of contract. The bidder to whom a contract is awarded will be required to furnish a performance bond and a labor and materials bond, each in the amount of 100% of the contract price, with sureties satisfactory to the Authority. The Bethlehem Authority reserves the right to reject any or all bids or to waive any informality in the bidding.

By order of the Bethlehem Authority
E. W. BOYLE, CHAIRMAN
ROBERT L. FOX, SECRETARY

OFFICIAL PROPOSALS

Bids July 11, 1950 (2277)

Heating and Ventilating

BETHLEHEM, PA.

NOTICE TO BIDDERS

Sealed proposals will be received by the Bethlehem Authority at the office of the Authority, 10 East Church Street, Bethlehem, Pa., until 11 A.M. (Daylight Saving Time) on July 11, 1950, and will be publicly opened and read aloud for the Heating and Ventilating of the Water Treatment Plant, as per specifications prepared by Gannett, Fleming, Corddry & Carpenter, Inc., Consulting Engineers, Harrisburg, Pa., copies of which may be obtained from the Authority's Engineers, 1 North Second Street, Harrisburg, Pa., upon deposit of $25.00 for each set of plans and specifications. The deposit will be refunded if the plans and specifications are returned within ten days after the opening of bids in good condition. If the plans and specifications are not returned within the time stated, the amount of the deposit will be retained by the Authority. Each bid must be accompanied by a certified check, bank draft or cash bond in the amount of 10% of the bid, made payable to the Bethlehem Authority, as a guarantee that the bidder will enter into a contract and furnish bonds as required within ten days after the award of contract. The bidder to whom a contract is awarded will be required to furnish a performance bond and a labor and materials bond, each in the amount of 100% of the contract price, with sureties satisfactory to the Authority. The Bethlehem Authority reserves the right to reject any or all bids or to waive any informality in the bidding.

By order of the Bethlehem Authority
E. W. BOYLE, CHAIRMAN
ROBERT L. FOX, SECRETARY

Bids July 11, 1950 (2276)

Electric Power, Control and Lighting System

BETHLEHEM, PA.

NOTICE TO BIDDERS

OFFICIAL PROPOSALS

Bids July 11, 1950 (2275)

Sewerage Treatment Plant

TOWNSHIP OF LEVITTOWN,
NEW JERSEY

NOTICE TO CONTRACTORS

Bids will be received by the Township Committee of the Township of Levittown, New Jersey, at the Municipal Building, Levittown, New Jersey, until 8:00 P.M. (Eastern Daylight Saving Time) on July 11, 1950, and will be publicly opened and read aloud for the Sewerage Treatment Plant, as per specifications prepared by Gannett, Fleming, Corddry & Carpenter, Inc., Consulting Engineers, Harrisburg, Pa., copies of which may be obtained from the Township Engineers, 1 North Second Street, Harrisburg, Pa., upon deposit of $25.00 for each set of plans and specifications. The deposit will be refunded if the plans and specifications are returned within ten days after the opening of bids in good condition. If the plans and specifications are not returned within the time stated, the amount of the deposit will be retained by the Township. Each bid must be accompanied by a certified check, bank draft or cash bond in the amount of 10% of the bid, made payable to the Township of Levittown, as a guarantee that the bidder will enter into a contract and furnish bonds as required within ten days after the award of contract. The bidder to whom a contract is awarded will be required to furnish a performance bond and a labor and materials bond, each in the amount of 100% of the contract price, with sureties satisfactory to the Township. The Township of Levittown reserves the right to reject any or all bids or to waive any informality in the bidding.

By order of the Township Committee
TOWNSHIP OF LEVITTOWN, PA.
Township Engineers

(Continued on page 80)

The CONTRACTOR—
like a GENERAL
Prepares for Victory

B

BUILDING CONSTRUCTION ENGINEERING NEWS RECORD

OFFICIAL PROPOSALS
(Continued from page 79)

(784)

New Jersey Turnpike Authority

Sealed proposals will be received by the New Jersey Turnpike Authority for the following contract:

CONTRACT NO. 22

The work to be performed under this Contract includes the construction of the Grade separation structures, roadway paving and incidental work in connection with the construction of the New Jersey Turnpike, Section 2, between Woodbridge Heights and Hartford, in Middlesex, Union and Burlington Counties, New Jersey.

Principal items of work include ...

Contract Documents may be inspected by prospective bidders during office hours after May 26, 1950, at the office of the New Jersey Turnpike Authority, 67 Church Street, Trenton, New Jersey, and at the office of the Resident Engineer, Turnpike Project Office, Trenton, New Jersey, and may be obtained from the Contractors Engineering Company, Incorporated, 100 South Second Street, Harrisburg, Pennsylvania, and Old Bridge Avenue, Woodbridge, New Jersey.

. . .

CONTRACT NO. 23

The work to be performed under this Contract includes the construction of the Grade separation structures, roadway paving and incidental work in connection with the construction of the New Jersey Turnpike, Section 3, between Hartford and Mansfield, in Burlington County, New Jersey.

Principal items of work include ...

Contract Documents may be inspected by prospective bidders during office hours after May 26, 1950, at the office of the New Jersey Turnpike Authority, 67 Church Street, Trenton, New Jersey, and at the office of the Resident Engineer, Turnpike Project Office, Trenton, New Jersey, and may be obtained from the Contractors Engineering Company, Incorporated, 100 South Second Street, Harrisburg, Pennsylvania, and Old Bridge Avenue, Woodbridge, New Jersey.

. . .

OFFICIAL PROPOSALS

for more than $500,000.00 and must be delivered at the place designated above on or before the hour named. Copies of the proposal form to be used for submitting proposals, of the form of the proposal bond, of the form to be used for the financial statement and for the plans and specifications may be obtained from the office of the undersigned and the special addressed envelope furnished for inclosing therein the proposal and the said financial statement. Proposals must be submitted in accordance with the requirements of the Instructions to Bidders.

Contracts will be awarded or all proposals rejected within fifteen (15) days from the date of opening proposals. The right is reserved to reject any or all proposals.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast
Chairman

May 24, 1950

Bids: June 12, 1950 (785)

Access Roads and Landscaping for Temporary Terminal Buildings

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT NYA-125

Sealed proposals for the construction of access roads and landscaping for the Temporary Terminal Buildings at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, N. Y., until 11:30 A.M. Monday, June 12, 1950, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $10 per set. The deposit will be refunded upon return of documents in good condition not later than 10 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, June 1, 1950

Bids: July 14, 1950 (775)

Pumping Equipment

BETHLEHEM, PA.
NOTICE TO BIDDERS
SEWAGE TREATMENT PLANT
CONTRACT NO. 2

Sealed proposals addressed to the Bethlehem Authority at the office of Bethlehem, Pa., for Sewage Pumping Equipment and Appurtenances for Sewage Treatment Plant will be received at the office of the Authority, 325 Broadway, Bethlehem, Pa., until 11:00 A.M. (Eastern Standard Time) the 14th day of July 1950 A.D. at which time and place they will be publicly opened and read.

Plans and specifications, forms of contract and bidding blanks are on file and may be viewed at the office of the Authority, 325 Broadway, Bethlehem, Pa., and may be obtained from the Authority upon a deposit of $25.00 which deposit will be refunded if a bona fide bid is submitted and not withdrawn within two weeks of the date of the opening thereof, or upon the return of the plans and specifications in good condition within two weeks of the opening of bids. No bidder will be permitted to withdraw his bid for the period of thirty (30) days after the opening of bids, without the consent of the Authority.

The Bethlehem Authority reserves the right to reject any or all bids, to waive any informalities in or to accept or reject any or all bids.

Each bidder must deposit with his bid security in the amount of ten (10) per cent of the amount of his bid in the form and subject to the conditions provided in the Information for Bidders.

Attention of bidders is particularly called to the requirements as to conditions of employment to be observed and minimum wages to be paid under the contract.

Proposals shall be made upon forms furnished by the Architect, prepared in accordance with the Information for Bidders, enclosed in a sealed envelope bearing on the outside the name of the bidder and the name and title of the work to which the proposal relates.

No bidder may withdraw his bid within 45 days after the actual date of the opening thereof.

Plans available May 31, 1950.

CHARLES HAIRIE
District Clerk

OFFICIAL PROPOSALS

Bids: June 16, 1950 (780)

Alterations and Addition to Present School Building

NOTICE TO CONTRACTORS
TOWN OF PENFIELD, MONROE COUNTY, NEW YORK

Subject to approval of plans and specifications by the Education Department, Albany, New York, separate sealed bids for General Construction Work, Heating and Ventilating Work, Plumbing Work and Electrical Work for alterations and additions to the present school building, development of the grounds and sewage disposal, all in accordance with plans and specifications, will be received by the Board of Education of the Penfield Central School, Town of Penfield, Monroe County, New York, at the office of the present school, Five Mile Line Road, Penfield, New York, until the hour of 8 P.M. June 16, 1950, at which place and hour they will be publicly opened and read aloud.

The Information for Bidders, Form of Bid, Plans and Specifications may be examined at the office of Carpenter and Harrow, Architects, 16 Reynolds Arcade, Rochester 14, New York, and copies thereof obtained upon deposit of $25.00 for each set. Any bidder, upon returning such set in good condition, will be refunded his deposit and any non-bidder upon returning such set will be refunded $15.00 unless the set is made a part of the contract, in which case the $25.00 will be refunded.

The Board of Education of the Penfield Central School reserves the right to waive any informalities in or to accept or reject any or all bids.

Each bidder must deposit with his bid security in the amount of not less than five per centum (5%) of the face bid in the form and subject to the conditions provided in the Information for Bidders.

Attention of bidders is particularly called to the requirements as to conditions of employment to be observed and minimum wages to be paid under the contract.

Proposals shall be made forms furnished by the Architect, prepared in accordance with the Information for Bidders, enclosed in a sealed envelope bearing on the outside the name of the bidder and the name and title of the work to which the proposal relates.

No bidder may withdraw his bid within 45 days after the actual date of the opening thereof.

Plans available May 31, 1950.

CHARLES HAIRIE
District Clerk

Official Proposals Columns of

ENGINEERING NEWS-RECORD

are MUST reading, each week for contractors, engineering-construction companies, equipment and materials manufacturers, all over the United States . . . and used regularly for over 50 years by government, state, county and municipal departments to advertise bids.

Official Proposal Division

Engineering News-Record
330 West 42nd St.
New York 18, N. Y.

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PROPOSALS. $1.00 a line an insertion.

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NEW ADVERTISEMENTS received by June 5th at the New York Office 330 W. 42 St., N. Y. 36, will appear in June 15th issue, subject to space available.

CONSTRUCTION PERSONNEL

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P. O. Box 295 Metuchen, N. J.

BOLT and NUT SALESMAN

Heavy Hardware Manufacturing Company offers position to salesman experienced in contacting general contractors.

SW-6539

ESTIMATOR

Wanted by established Pittsburgh firm of commercial and industrial contractors. Must have had experience with contractors except in smaller work. State salary expected and when available. Splendid opportunity for advancement.

P-6506

POSITIONS VACANT

POSITIONS WANTED

ENGINEER LICENSED
in New York State
Also Sales Engineer

Experienced in bridge construction and alterations. Permanent position for right man. Reply stating experience to

[illegible]

GRAVEL PLANT SUPERINTENDENT

Wanted for operating and managing portable and permanent plants in Indiana and Michigan. State experience, references and salary.

P-6508

CITY OF DETROIT

Detroit Civil Service Commission
1501 Water Board Bldg.
735 Randolph Street Detroit 26 Mich.

SELLING OPPORTUNITY OFFERED

PART TIME WORK WANTED

SELLING OPPORTUNITY WANTED

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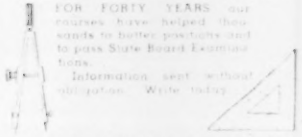

FOR FORTY YEARS our courses have helped thousands to better positions and to pass State Board Examinations.

Information sent without obligation. Write today.

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EMPLOYMENT SERVICE

BUSINESS OPPORTUNITY

For Sale

For Sale—Large gravel

POSITIONS WANTED

WANTED

WANTED

Grubbing and Clearing That Can Be Done With D-8 Bulldozers.

Write
CARL ERICKSON
FINCONNING, MICHIGAN

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A.S.C.E. [illegible] years layout and supervision of heavy construction. Desires position in New York vicinity. Experience includes dock, pier, trestle, highway, heads bridges, etc. Available on [illegible] Married. References.

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REPUTABLE GENERAL CONTRACTOR INTERESTED IN OBTAINING EASTERN DISTRIBUTORSHIP FOR SOME PRODUCT IN THE EAST.

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BOYCE COMPANY

Phone 3-2530 Clearwater, Fla.

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NEW, SAFER, SHOCK RESISTANT

SUN GLASSES

Reduce Eyestrain From Glare & Harmful Rays

Reg. $10.00 Quality

$2.25 For 2 $4.00

P. Post Paid

MAKE QUICK ACCURATE SIGHTS

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NEW IMPROVED HAND

SIGHTING LEVEL

COMP. WITH U. S. ARMY PLASTIC POUCH

SPECIAL LOW PRICE $1.85

SHIP. CHG. 15c EXTRA EACH

BE SAFE—BE SURE ON LAND OR SEA

Brand New U. S. Navy

POCKET COMPASS

DEPENDABLE ACCURATE

Has Many Features Not Found in Compasses Many Times This Price

Regular $10.00 Value

$3.00

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J. JACOB SHANNON & CO.
214 N. 22nd St. Phila. 3, Pa.
The Oldest Equipment House in Phila.

• STRUCTURAL STEEL SHAPES •

New and Used—Immediate Delivery

At present our inventory of steel shapes and forms includes a full line of both new and used steel especially for heavy construction work. 4" I beam to 36" Girder Beam. 14" Columns 287# 398#

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Stock list on request. Write, wire or phone.

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563 E. Tremont Ave., New York City, N. Y.
Cypress 9-5440-1

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FOR SALE

Allis Chalmers Model AD Tandem tires, fully equipped, diesel.

Huber 5 to 8 ton, Tandem, hydraulic steering, gas.

Both in excellent condition and attractive price.

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ALL LATE MODELS

1—N.W. Shovel 2½ c.y. Model 80D
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1—Caterpillar D8 Angledozer
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Williams Construction Co.
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Baltimore 20, Md.
Phone—Essex 1310

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All Types of
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Will pay spot cash for sand and gravel plant in good shape. State location, Capacity, and bottom price.

W-6022, Engineering News-Record
[illegible] Fifth Ave., New York 36, N. Y.

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Ransome 27E single drum paver in good operating condition. $3000

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Edison 1-1010

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Model 180 Single Pumpcrete
1000' of pipe and fittings
For Quick Sale $5500.00

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20 & 30 ton capacity surplus

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LOWBED TRAILERS

Rogers 20 Ton & 35 Ton
Fruehauf 25 Ton & 40 Ton
LaCrosse 18 Ton, 19 Ton & 24 Ton
Tilt 3½, 5 Ton & 5 Ton
Rogers 20 Ton Tagalong Demonstrator
Fruehauf 30-40 Ton Solid Tire Cheap

If the Lowbed Trailer you need isn't in this List, advise us what you want and we will find it for you.

C. C. & F. F. KEESLER
1515 Lincoln Ave. Prospect Park, Pa.
Phone Ridley Park 1606

DIESEL LOCOMOTIVE CRANE

American Model 825 MD 25 Ton Diesel Locomotive Crane, 50' Boom. Murphy Model ME46 Diesel. New Fall 1945. Like New Condition.

BOYE & TINKLER CO.
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STANDARD SHOVEL FRONT

for either of the following shovels: Lorain 79 or 80 or 820. *Call or write.*

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1—1½ Cu. Yd. Amsco Shovel bucket, new, complete with teeth and sheave for P & H Shovel. Price $1450.00

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1 TO 6 USED SCRAPERS

Minimum 12 Cubic Yards Struck
Maximum 25 (cable controls)

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AVAILABLE FOR QUICK DELIVERY

CRANES & SHOVELS

LORAIN MODEL 41 SHOVEL powered by GMC Diesel engine with electric starter. Mounted on crawlers. New in 1948. New guarantee.

S & L CRANE, brand new, 5 tons capacity, 18' boom, double drum. Mounted on solid rubber tires.

P & H Model 600, 1¼ yard CRAWLER Shovel powered by gas engine. Mfg. in 1932. In operating condition.

TRACTORS

ALLIS CHALMERS, Model HD 7, TRACTOR, 63" tread, canopy, starter, Gar Wood hydraulic bulldozer. Mfg. in 1947. In good condition.

BUCYRUS ERIE, Model TD 9 DOZER SHOVEL. New in 1946. In very good condition.

INTERNATIONAL HARVESTER, Model 14 heavy duty front axle with spring, electric starter, muffler, 1 set rear wheel weights, tires 6.00x20 8 ply front, 12.00x24 6 ply rear. Trojan bulldozer. New in 1948. In good condition.

INTERNATIONAL HARVESTER, Model TD 6, 50" tread, standard attachments and B-E hydraulic bulldozer. New in 1946. In fair condition.

INTERNATIONAL HARVESTER, Model TD 14, 74" tread, 18" shoes, standard attachments and ISAACSON hydraulic bulldozer. New chains, rear sprocket, top and bottom rollers. New in 1947. In good condition.

INTERNATIONAL HARVESTER, Model TD14 with HUGHES-KEENAN ROUSTABOUT crane. New in 1942. In fair condition.

INTERNATIONAL HARVESTER, Model TD 18, 74" tread. With electric starter and light, standard equipment, and ISAACSON hydraulic bulldozer. New in 1947. In good condition.

PUMPS

CHAIN BELT, Model 40 M, self-priming, Centrifugal Pump, Wisconsin 4 cyl. engine. New in 1948. Guaranteed condition.

JAEGER, MODEL 10P, self-priming centrifugal pump, 6 cyl. Hercules engine. Good condition.

STERLING 8" self-priming Centrifugal Pump, Waukesha 6 cyl. engine. Good condition.

MISCELLANEOUS

PUMPCRETE, DOUBLE, Model 180, powered by WAUKESHA 6 cyl. engine with 1c mixer powered by LE ROI gas engine. Few fittings, no pipe. On skids. Made in 1949. In good condition.

HOUGH, Model HLA Payloader with 1 yard 62" hydraulic bucket. Mfg. in 1947. In excellent condition.

HOUGH, Model HLD Payloader with 1 yard Hydraulic bucket consist and blade. New in 1948. In excellent condition.

HOUGH, Model HLD Payloader with 1 yard gravity dump bucket. New in 1946. Operating condition.

HOUGH, MODEL HF Payloader with ¾ yard hydraulic bucket, CAB, extra blade. New in 1947. Very good condition.

AUSTIN-WESTERN, Model 55, Grader with scarifier, 8' hydraulically operated Moldboard. New in 1949. In very good condition.

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- 1 Cat D8 with DDPCU LaPlante Choate Angledozer.
- 1 D6 less than 2000 hours with brand new LaPlante Choate Angledozer.
- 1 D2 Cat with tracks on half yard bucket.
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200 ton Hot Mix Asphalt Plant.
100 ton self propelled derrick scow.
30 ton electric gantry cranes.
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2½ yd. P&H dragline, 120' boom.
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Cheaper than offices constructed on location.

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Write for complete information.

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BUCKETS

Distributors for Hamilton Multiple Cord
Lorain ¾A Truck Crane, 10 ton
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Many Crawler Cranes, Shovels
Many Truck Cranes, Shovels

VAN HOUTEN MACHINERY CO.

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INSLEY TRUCK CRANE

½ cy cap. 28' boom, outriggers, modern design.
Special price (about $8,175.00) f.o.b. New York.
Can be financed on rental purchase.

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Tel. Canal 6-5693

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20-10 TON TO 25 TON CAPACITY

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LIMA & P & H CRAWLER CRANES

30 TON TO 50 TON CAPACITY

SECTIONAL BOOM LENGTHS TO 175 FEET

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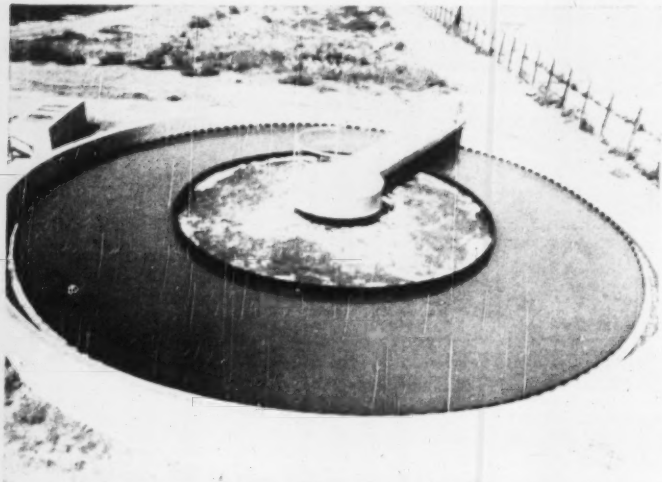

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(Continued on page 91)

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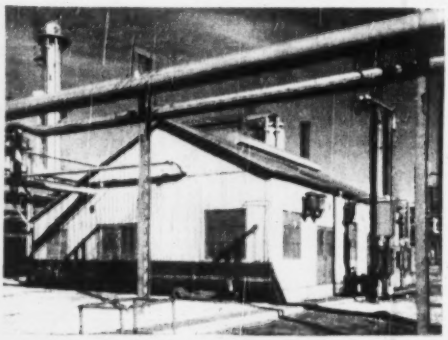

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Long and short cycles in heavy gumbo

The job included widening shoulders, raising grades, and straightening curves on 13 miles of Hwy. 81 north of Shelly. Material was all gumbo, extremely sloppy when wet . . . and, at best, tough and rubbery as it dried. Proper drainage and soil selection required one million station yards of overhaul. To handle ⅓ of this total, Moen Bros. put their two electric-control C Roadsters on side-borrow work where hauls varied from 0 to 7400'. Here's typical performance:

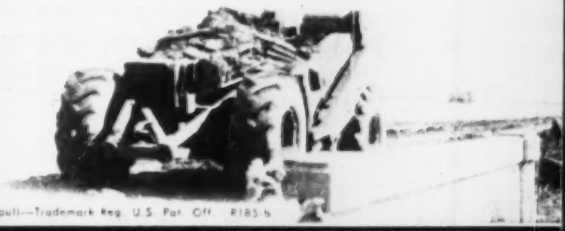
On 4800' cycles, each push-loaded "C" moved 9½ pay yards of heavy fill every 7.3 minutes . . . each averaged 78 yards per hour despite rough, soggy roads throughout job. Company President, Ingvald Moen, reports, "The Tournapulls paid off on *any length haul* we encountered here!"

Maintain 95% operating efficiency

Not only did Moen find the LeTourneau high-speed "C's" versatile "mudders", but he also reported 95% mechanical efficiency for his two machines.

Moen's experience is no exception. These rubber-tired C Tournapulls have earned a wide reputation for being money-makers wherever they go. Their giant, 21.00 x 25 low-pressure tires, power-proportioning differential, and electric controls, assure you of all-weather performance . . . more yards per hour under all job conditions.

It will pay you to get all the facts. Write . . . or call your LeTourneau Distributor about the rubber-tired C Tournapulls TODAY!



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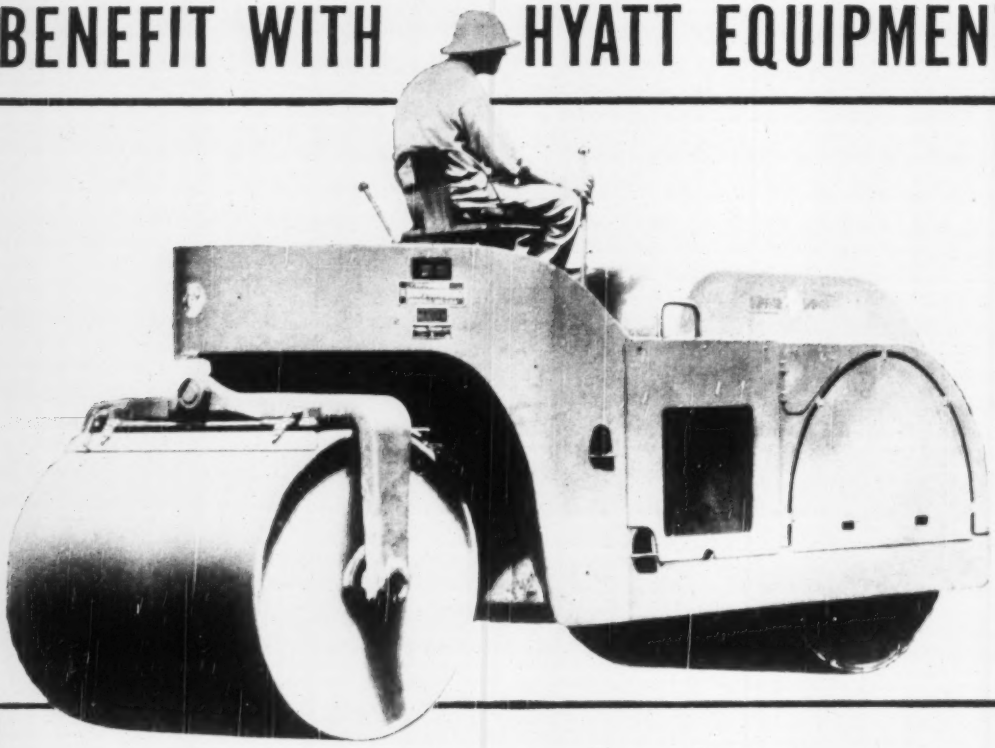

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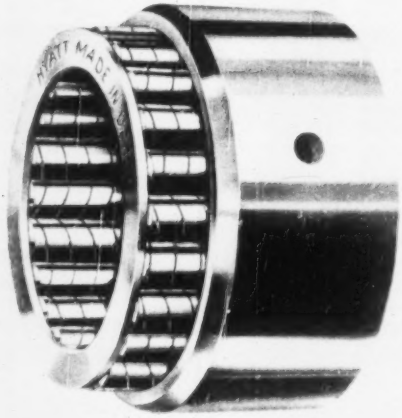

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POWER SCRAPER

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Crescent bottomless bucket, exclusive feature of Sauerman scraper machines, handles large loads faster and requires less power, size for size, than any other type of scraper. It digs in any kind of ground, dry, wet or sticky. Renewable digging lip absorbs most of the wear, adds many years to useful life of bucket.

Sauerman machines provide wide range of handling capacities and operating spans. Electric, gasoline or Diesel power.

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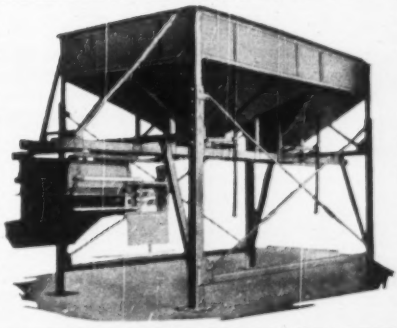
Branch Offices: Denver, Dallas, New Orleans

See our catalog in Sweet's



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—Reduces Your Job Cost

Use with a

10S-11S-14S-16S Mixer

Complete with scale for two or three aggregates.

With two or three overhead storage bins.

For use on culvert, bridge, curbing, foundation jobs.

Wherever above size mixers are in operation.

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Distributors Located Throughout U. S.

CONCRETE MIXING and POURING ON THE JOB!

Shown here ready for travel. A Complete Mobile Concrete Mixing Unit and Elevator.

GREATER PROFIT ON EVERY JOB!

THE ONE-YARD MIXERMOBILE GIVES: Complete mobility . . . more jobs covered per day! One complete unit means more economy on every job. It saves the cost of hauling and erecting a tower. It saves the cost of hoist and storage hopper because these are included with the attached tower. It saves through the use of dump trucks . . . concrete is mixed on the job (with specially designed scale batch aggregates can be weighed for actual weight mixing).

READY MIX ECONOMY WITH MIXERMOBILE. Use the Mixermobile as a portable elevating and agitating storage plant for ready mix concrete. With storage capacity of 4½ cubic yards, Mixermobile eliminates costly stand-by time of ready mix trucks. One man handles the complete operation, both mixing and elevating. Save time, labor with Mixermobile.

Turns Out 200 Cubic Yards of Concrete Per Day

FEATURES INCLUDE: Hydraulic Controls, Discharge Timer, Foolproof Water Control System.

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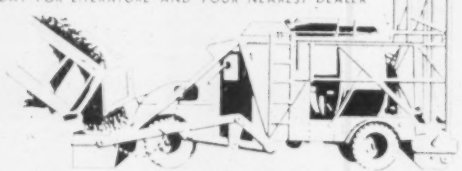


We reserve the right to make improvements in design and specifications without notice.

MIXERMOBILE MANUFACTURERS

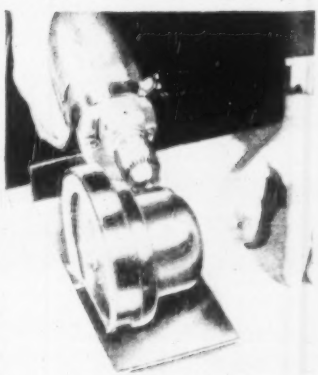
WAGNERMOBILE

Box 7527 • Portland 20, Oregon

tion is mechanical and positive the moment engine is started. — Lindberg Agricultural Sprayer Co., 5155 Lorraine Ave., Detroit 5, Mich.

Horizontal-Sliding Window

Aluminum window of the horizontal sliding type has sliding panel supported on two rollers. Features include: No putty is used in installation, no painting is required, and no sash balances, operating cranks, or projecting hinges are involved in the design. A high pile, woven, water-resistant and practically frictionless weatherstrip is used to eliminate metal to metal contact and "scratching." Washing is simplified by the fact that sliding panels lift out and all washing is done from inside the room. These units make possible using windows in continuous spans of any length without danger of buckling due to unequal expansion of aluminum and masonry. — Burke Barrette Co., Inc., 8544 Grand River, Detroit 4, Mich.



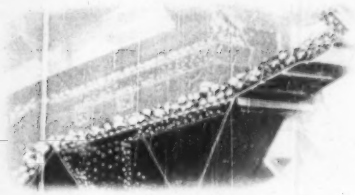
Saw Attachment for Drills

Attachment converts any 1-in. chuck-type drill into a portable circular saw. Wood, soft metals, composition materials, where it is cutting, while cut is made, also guide makes the job easy and accurate. — The Ball Saw Co., 3600 Cortland St., Chicago 47, Ill.

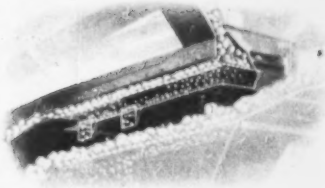
Diesels With Higher Ratings

Increased horsepower and improved performance are features of the new

Continued on page 96



WITH BOTTOM DECK FEED only pit run is fed to the bottom deck of the 3½ deck screen. Half deck rejects sand. Pit run specification goes to pay hopper without going through a crusher; ... passes through only one screen. Oversize goes to jaw crusher.



ONLY CRUSHED MATERIAL is screened on the top deck. Specification material is by-passed around the bottom deck to the pay hopper. It does not pass through the bottom deck. No scalping screen is necessary. Stone chips can be produced if desired.

How a twist of the wrist increases production with BDF

IN YOUR BUSINESS, time is measured in rock and gravel tonnage. Every hour of smooth, high speed, uninterrupted production is worth many dollars and cents of profit. *Time is money.*

With the invention of Bottom Deck Feed, Pioneer engineers found an ingenious way to pack more productive hours into every working day. This is done by eliminating the necessity of frequent screen changes . . . by permitting continuous adjustment of balance between the roll crusher and the jaw crusher — just a twist of the wrist — *while the plant is in operation.* See detail at right.

And because the top and bottom decks both produce specification material independently, bottom deck feed can actually double the effective screening capacity of a plant. See details above.

If you believe "one gravel plant is as good as another," send for our catalog on bottom deck feed plants. It shows in detail how this series of portable plants will out-produce any other plants built today. PIONEER ENGINEERING WORKS, 1515 Central Avenue, Minneapolis 13, Minnesota.

THE FLOW OF MATERIAL throughout the plant is regulated by a simple ratchet adjustment on the jaw crusher. If the material is coarse and the jaw is overworked, open the jaw slightly and send a larger product to the roll crusher. If the material is fine, close the jaw. You don't have to stop the plant to change screens. A twist of the wrist does it.

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☐ ROLL CRUSHERS	☐ BOOTLEGGERS	☐ AUTOMATIC CONTROLS

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Contractors
Harris Structural Steel Company,
New York, N.Y.

USS

over Mississippi River of U·S·S I-BEAM-LOK!

Nearly a mile long, the giant new cantilever structure spanning the broad Mississippi at Memphis is the latest and largest bridge over this great river.

Designed to take ample care of both present and foreseeable future heavy, high-speed traffic, this wide four-lane bridge (officially named the Memphis and Arkansas Bridge) has two 24-ft. roadways of concrete-filled U·S·S I-BEAM-LOK Steel Flooring extending 3,694 ft. of its length with a total of 167,000 square feet.

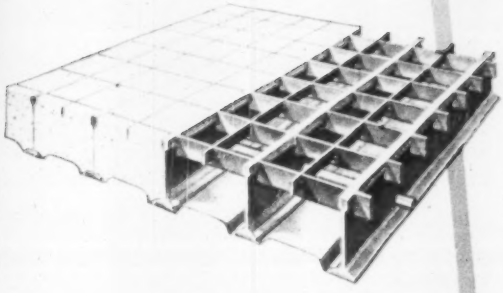
The selection of U·S·S I-BEAM-LOK for this big bridge further indicates the over-all economies resulting from the use of this type of lightweight steel flooring. Leading bridge and highway engineers continue to prefer U·S·S Armored I-BEAM-LOK where it is necessary to reduce the cost of foundations and super-structure.

Not only does the concrete-filled grid of I-BEAM-LOK provide a smooth-riding, safe, skid-resisting, fire-proof and long-life surface, but it requires less maintenance than other flooring. Furthermore, it can be erected easily and speedily. In the re-flooring of existing bridges, its lightweight and great strength often make it possible to increase H-load ratings without major changes in existing bridge structures, and interruption of traffic is held to a minimum.

U·S·S I-BEAM-LOK is available in both concrete-filled and open types. The concrete-filled type comes in 3" and 4½" sizes and in weights of only 47 and 55 lbs. per square foot. The open type flooring is even lighter, it weighs approximately 18.9 lbs. per sq. ft. as installed.

To find out more about this "modern floor for modern traffic," contact the office nearest you. Our engineers will be glad to discuss its possibilities with you.

CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH • COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM • UNITED STATES STEEL EXPORT COMPANY, NEW YORK



1. VERY LIGHT UNIT WEIGHT, thus reducing dead load and the ultimate cost of complete structure.
2. GREATER RIGIDITY OF ENTIRE ROADWAY. Positive connection between slabs and stringers.
3. EASE OF ERECTION, with no concrete forms necessary. Saves time in completion of structure.
4. SMOOTH HARD SURFACE for safe, high-speed traffic.
5. LOW MAINTENANCE COSTS. Bridge floors of U·S·S Armored I-Beam-Lok have averaged 22 to 25 years of heavy use before the surface required any maintenance.

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CONCRETE SURFACER
MODEL A

"Berg" equipment is used extensively for surfacing and finishing applications on concrete construction.

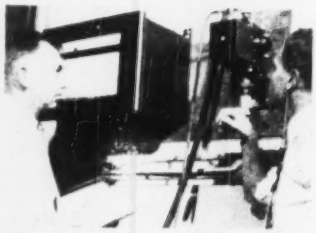
The many "BERG" Models available, permit exact selection for your particular application.

The distinctive "BERG" features give you the kind of results that are realized in better quality work, combined with lower costs.

"BERG" Heads and Attachments are interchangeable, thereby providing adaptability for vibrating, wire brushing, sanding and polishing applications.

THE CONCRETE SURFACING MACHINERY CO.
4667 SPRING GROVE AVE
CINCINNATI 32, OHIO

4-cylinder International "9" Series of diesel power units and automotive engines. As a power unit, the UD-9A delivers 62.5 hp at 1,600 rpm under intermittent load. Weight is 2,060 lb. The UD-9A operates at governed speed at 1,800 rpm, delivering 70 hp at that speed. Weight is 1,500 lb. Both units have an inbuilt gasoline conversion all-weather starting system and full-pressure lubrication of moving parts.—International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.



Recording Turbidimeter

Photoelectric instrument automatically measures and records amount of suspended particles in a liquid. The recording turbidimeter provides a means for monitoring and controlling processes in water treatment plants or wherever turbidity or a significant constituent of the process. Results are not subject to variations in color of liquids. The instrument will read any desired range of turbidity such as 0 to 10 ppm, 100 to 1,000 ppm, 500 to 5,000 ppm, etc. Operating on a 115-v, 50-60 cycle circuit, the equipment has a power consumption of approximately 150 watts.—General Electric Co., Apparatus News Bureau, Schenectady 5, N. Y.

Light, Medium-Duty Trucks

A line of light and medium-duty trucks is available in 10 models with gross vehicle weights to 21,500 lb. Tractor trailer units are available in weights to 42,000 lb. Wheelbases range in the 5-ft. Loadmaster series from 120 to 230 in. Gasoline engines are rated to 141 at 3,600 rpm. Maximum width is 96 in. Mechanical improvements include wider track front axle and shorter wheelbases on tractor trailer units. Cabs and front and rear springs have been strengthened. Wheel steering gear ratios and tires on single-speed, two-speed, and two-speed double-reduction final drive are available. A choice of four engines provides ratings to 126 hp.—Federal Motor Truck Co., Detroit 9, Mich.

Fire-Retardant Coating

Chemical fire retardant is designed for spraying on walls, fiberboard partitions, wood, textiles, and other materials. Heat of a fire on treated article liberates a non-irritating non-toxic gas which dilutes and cools the products of combustion to below their spontaneous ignition point. At the same time, Flamort produces a glaze and char-like coating at the area contacted by the flame. Tendency to smolder is eliminated. Flamort powder is packed in fiber drums and wooden kegs; solutions are sold in quart and gallon bottles, and in 5, 10, 16, 50, and 50-gal kegs.—Flamort Chemical Co., 746 Natoma St., San Francisco 3, Calif.

High-Lift Hydraulic Loader

Dumping height of 13 ft 6 in. (to lowest point on bucket) is feature of the Model 100, Type GL Dempster-Diggster. This Diggster has a crowd reach of 10 ft 6 in. and will dig through an 18-ft bank. The Dempster-Diggster operates with hydraulic crowd and hoist action, and is available with crawler-type traction.—Dempster Bros., Inc., Knoxville, Tenn.

New Product Briefs

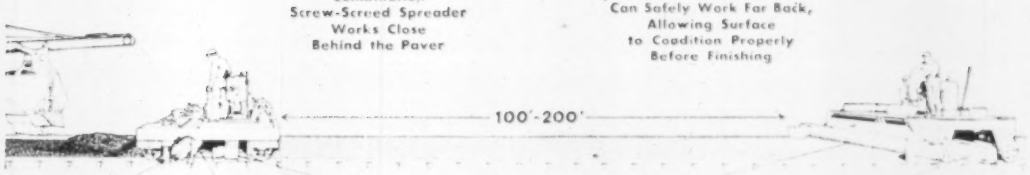
Right-angle-drive power unit permits drilling between 12-in. center points and other close or obstructed places. Mixer, Milwaukee Electric Tool Corp., Milwaukee 9, Wis.

Pressure-fed hand paint brush is fed through a hose connected to the handle. Feature is that it eliminates constant stopping and dipping into a container. Mixer, Hudson Coatings Co., Belleville 9, N. J.

Jaeger 3-Screed Paving Team

(Accurate Metering Screed on the Spreader,
Transverse Screed and Diagonal Screed on the Finisher)

gets faster production and labor-savings never before possible on concrete slab



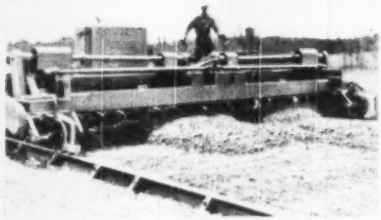
Re-mixing spreader screw: Reworks, compacts and spreads material evenly from form to form.

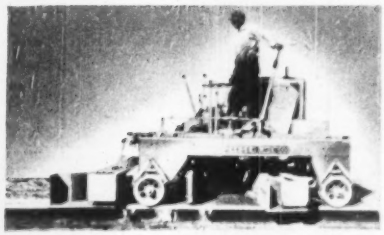
Initial strike-off to approximate grade (all that any other spreader can accomplish)

No. 1 — Metering screed Makes precision strike off with 12" oscillating shoe. Corrects any excess or deficiency left by initial strike-off. Saves cost of shovelers for carry back and for costlier back tracking with the paver.

No. 2 — Transverse Screed: Works with just the right roll of material as "metered" by the Spreader. No piles to buck. Uniform compaction at all times.

No. 3 — Diagonal Screed: Pivots to any angle needed to carry material up hill on pitched slab or super-elevated curves, compacts it solidly against higher form. Corrects any irregularities left by transverse screed because it meets material at different point. Also finishes stiff mixes without tearing.





Note how the above Jaeger method fully mechanizes your operation, effects direct labor savings in front and in back of finisher, and insures faster, steadier, easier production of the maximum daily yardage your dual drum pavers can produce. Has eliminated requirement of a second finisher behind the spreader on high production work in several states.

Jaeger Type CSS Combination Screw-Screed Spreader: The only spreader that positively eliminates segregation and improves uniformity by remixing on the sub-grade — and also accurately meters to the finishing machine by second strike-off with 12" oscillating screed. Same machine can both spread and finish concrete base for bituminous surfaced city streets. Widths 10-15, 20-25 ft. Also available without oscillating metering screed, if so desired.

Jaeger Type X Diagonal Screed Finisher: The only finishing machine that can finish flush to higher form on pitched slab and super-elevated curves. Screed angle instantly adjustable as required. Angle finishing also averages out any irregularities left by front screed and finishes stiff concrete without tearing. Widths 10 to 32 ft.

Ask your Jaeger distributor or send for complete Concrete Paving Catalogs

THE JAEGER MACHINE CO., Columbus 16, Ohio

BITUMINOUS PAVERS

AGGREGATE SPREADERS

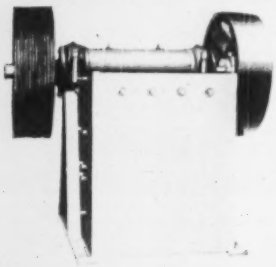
JAEGER

engineered equipment

PUMPS • MIXERS • COMPRESSORS • HOISTS

ROGERS

BETTER ROCK PRODUCTS
BY STAGED REDUCTION



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ROGERS JAW CRUSHER

• Greater Capacity • Less Maintenance • 18 Sizes

Extra tons of reliable production—that's what you get from a Rogers Jaw Crusher. Special long jaws really chew up the boulders; 6 primary, 12 secondary sizes up to 32 x 40 in. Husky oversize shaft and bearings keep them rolling with little or no maintenance.

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. . . . . the sand-cement product of the "CEMENT GUN," for Concrete and Masonry Repairs, Pre-Stressed Tanks, Steel Encasement and for lining Reservoirs, Sewers and Tunnels.

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MANUFACTURERS OF THE "CEMENT GUN"

Manufacturers' Publications

Safety-Training Film—This film is designed to convince workmen that it's smart to wear safety glasses. It shows which glasses are best for specific jobs, presents case histories of injured workers, and the dramatic "testimony" of blind persons. Film is available on 35-mm sound slidefilm, or in a new form for 16-mm sound-motion projectors.—NATIONAL SAFETY COUNCIL, 20 N. Wacker Drive, Chicago 6, Ill.

Heavy-Duty Power Plants—Specifications for a line of heavy-duty power plants is described in this 4-p data folder. Specifications listed include model, number of cylinders, bore and stroke, rpm's, piston displacement, compression ratio, maximum torque, and maximum brake hp. The figures are listed for each type of fuel which can be used (natural gas, "Octane" gasoline, distillate, or liquid petroleum gas). Photographs show typical applications.—MINNEAPOLIS MOLINE CO., Minneapolis 1, Minn.

Torque-Arm Speed Reducer—Brochure supplies selection of torque-arm speed reducer. Bulletin A-47-0, 10 pp, presents the complete story, augmented by full-size photos, of the entire mechanism and simplified selection table. The only information required to select proper size reducer is horsepower required and the speed and size of shaft to be driven. Also available in the brochure is information on size of belts and sheaves.—Dodge Mfg. Corp., Mishawaka, Ind.

Douglas Fir Plywood—Grades, uses, construction, and properties of plywood are listed in the 22-p 1950 buying catalog for Douglas fir plywood. Among the physical properties listed are nail bearing, acoustical, bending, rigidity, insulation, and condensation. All types of Douglas fir plywood are listed.—DOUGLAS FIR PLYWOOD ASSN., Tacoma Building, Tacoma 2, Wash.

Arc-Welding Equipment—Folder describes main features and specifications of Heliarc apparatus. Equipment illustrated in Folder L-7015 includes five models of torches for manual and mechanized operations, new argon-regulator and argon flow meters, especially designed to give accurate gas flows, ceramic and water-cooled shielding gas cups, electrodes, and argon-water shut-off valves. Advantages of the

(Continued on page 101)

New Office Building near Columbus Circle

This new baby skyscraper, on Broadway, between 55th and 56th Streets in New York's Columbus Circle district, was built recently to provide a large, flexible working space for the approximately 2000 employees of the Mutual Life Insurance Company of New York.

The 25-story, air-conditioned structure contains 575,000 sq ft of floor space. Its 2nd to 13th stories are to be utilized by the insurance firm, and the remaining floors will be rentable. The 153 ft x 210 ft building has a facing of limestone, aluminum spandrels and stainless steel trim, and is constructed with set-backs at the 9th, 11th, 13th, 20th, and 22nd floor levels. Its sidewalk will be kept free of snow and ice during winter months by means of heated anti-freeze, circulating through coils of Bethlehem Rayduct steel pipe which are embedded in the concrete.

To build this new member of New York's growing family of notable structures, Bethlehem was called upon for the fabrication and erection of some 6500 tons of steel.

Architects: Shreve, Lamb and Harmon Associates, New York
Consulting Engineers: Edwards & Hjorth, New York
General Contractors: Turner Construction Co., New York

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
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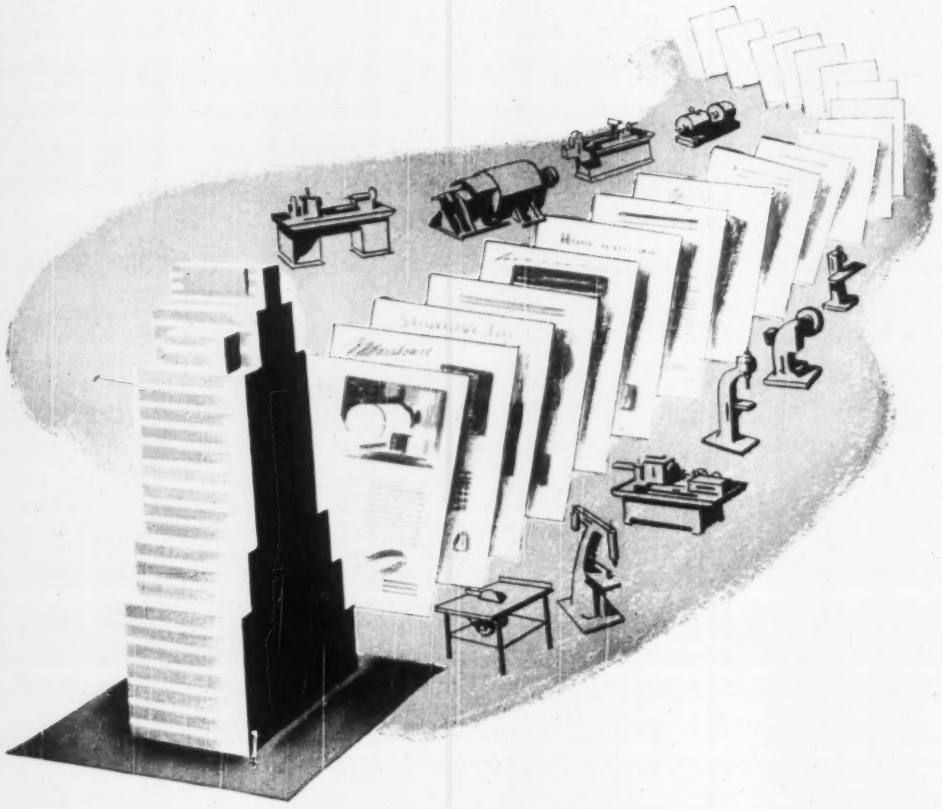
FABRICATED STEEL CONSTRUCTION

BETHLEHEM STEEL



The Parade that has no End

As you go through the pages of this magazine . . . or of any other McGraw-Hill publication . . . a colorful parade of advertising pages unfolds before your eyes.

If you are like thousands of other readers of these magazines, you'll become an avid spectator of this interesting, educational show. You'll take in the *whole* of this passing parade . . .

Why? Because this parade is a non-stop exhibition of all that's new in industry – new developments in products and services, new ways for the buyer to make use of these products, news which can often mean the difference between profit and loss to you.

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McGRAW-HILL

Publishing Company, Inc., 330 West 42nd Street, New York 18, N. Y.

inert gas shielded arc welding process and the metals for which it can be used are described, as well as the theory of the process. The Linde Air Products Co., Div. Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.

Wood Foundation Piles. Booklet describes proper evaluation of pressure-creosoted foundation piles for various types of construction projects. In reviewing conditions under which wood foundation piles should be pressure-treated and the permanent qualities of the treatment, the booklet cites important building codes which allow this type of pile for permanent construction. Typical examples of the use of these piles in various construction projects are described and pictured. Koppers Co., Inc., Wood Preserving Division, Koppers Bldg., Pittsburgh 19, Pa.

Diesel Engines. Type DS diesel engines are covered in Bulletin 173. This bulletin gives a general description of the design of the engine, low-cost fuel requirements, self-purging valve, lubrication and piston-cooling systems, and reversing gear arrangement. The engine is available with ratings from 5,570 to 8,350 hp, and in a marine model. ESM2501 — Nordberg Mfg. Co., Chicago & Oklahoma Ave., Milwaukee 7, Wis.

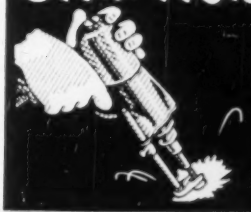
Industrial Wheel Tractors. Describing the Oliver line of wheel tractors, Catalog A-985, lists specifications, cross sections, and detailed data on engines and transmissions. One section is devoted to matched allied equipment including bucket loaders, scrapers, plows, mowers, brushcutters, forming scrapers, and trenchers. The booklet contains many application photos. The Oliver Corp., 19300 Euclid Ave., Cleveland 17, Ohio.

Carbon Monoxide Recorder. Precise measurement and recording of very low concentrations of carbon monoxide in air are possible with the MSA continuous carbon monoxide recorder described in Bulletin DBE-2. The bulletin contains a description of the operation and construction of the unit, including the drying system, motor and pump, circuit of sample, and performance. Mine Safety Appliances Co., Braddock, Thomas & Meade Sts., Pittsburgh 8, Pa.

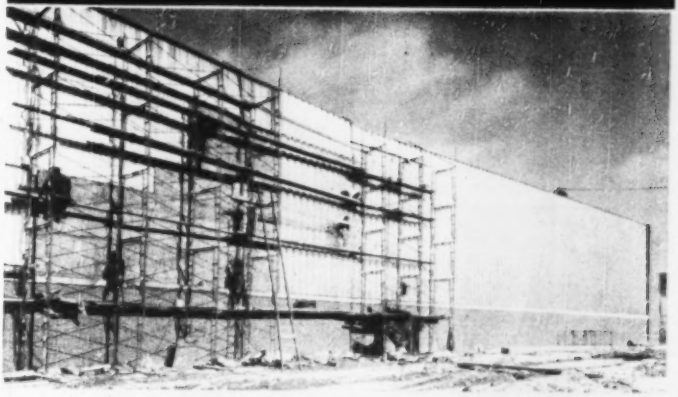
Building Panels. Porcelain-steel and aluminum building panels are described in a new 8-page catalog. Panels listed include the Type C heavy-gage and premium-gage, the Type D deck-

Continued on page 143

Stud Welding gets it On!



BETTER
FASTER
AT LOWER COST



"Breathing" Walls Quickly Secured with Nelson Studs

Stud Welding—the modern method of fastening—plays a prominent, cost-saving role in the construction of Lincoln Electric Company's unique 20-acre plant at Euclid, Ohio.

The building's sidewalls have steel on the interior and box-section aluminum panels on the outside, with insulating board between. Both the panels and the insulation are secured with Nelson studs which are quickly end welded to the steel with the lightweight, easy-to-operate stud welding gun.

For installing most any type of roofing and siding material—corrugated steel, aluminum, asbestos, protected metal, or flat asbestos-cement—the Nelson topside method is *tops*. It's being specified by leading engineers and architects, approved by material manufacturers, and used by alert roofing and siding contractors everywhere.

Nelson studs for securing insulating board are end welded with the portable stud welding gun to a spot secured

THE AUSTIN CO., Engineers and Builders

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Nelson Stud Welding

DIVISION MORTON GREGORY CORPORATION

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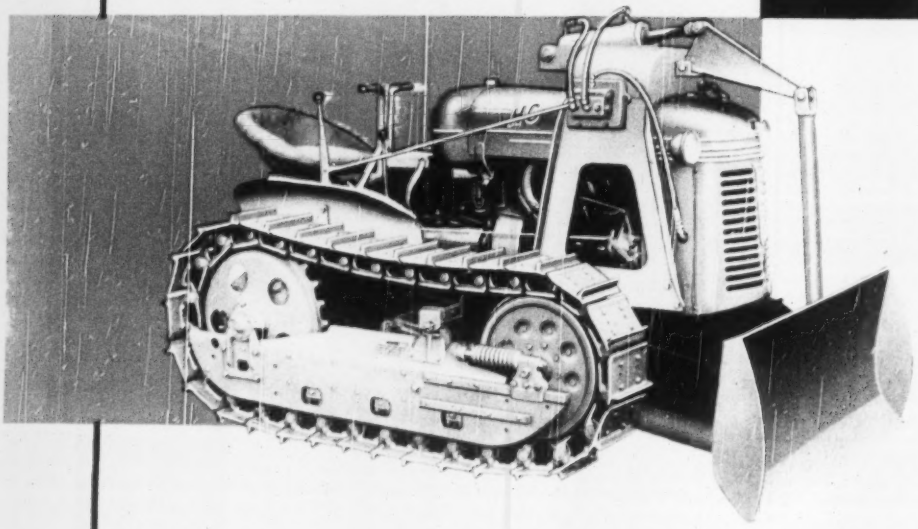
More *strength . . .* **More** *power . . .* **More** *everything*

..in the NEW OLIVER "HG"



There's *more* of everything you want in a crawler tractor in the NEW Oliver Model "HG." This new little crawler tractor is "big" with performance-making features because it was *field designed* . . . designed to meet the specifications that users said they wanted.

The NEW OLIVER "HG" Has More Strength

To handle the extra load and strains of mounted equipment, the main frame, transmission case and drawbar bracket assembly have been materially strengthened. No loads are imposed on final drive spacer casting. Power take-off is heavier . . . stronger.

Front wheels have been increased 50% in material thickness for longer life. Wheel flanges are on the outside of the track rails for better track alignment. New, heavier type track frame guide supports and buffer springs add strength to handle mounted equipment.

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The new "HG" engine gives you more drawbar horsepower . . . extra power to handle bigger loads . . . extra efficiency.

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A complete line of industrial wheel and crawler tractors

and floor panel of cellular steel construction; the Type AD deck and floor panel; acoustically treated panels; and Holorib steel deck for roof spans up to 8 ft 6 in. The bulletin contains 15 pages of detail drawings, fire-resistance ratings, methods of panel electrification, panel selection tables, and specifications.—DETROIT STEEL PRODUCTS CO., 5141 GRIFFIN ST., DETROIT 11, MICH.

Industrial Centrifugal Pumps.—Centrifugal pumps for applications involving abrasive or corrosive liquids are described in Catalog 4005. The bulletin describes design principles and construction features of the Nagle pumps, describes three vertical-shaft types, and lists materials of construction employed. It also contains a large section on pump impellers. Complete specifications and dimensions are listed for the entire Nagle line.—NAGLE PUMPS, CHICAGO HEIGHTS, ILL.

Diatomite Pressure Filters.—All information necessary to design complete water purification plants is given in Technical Bulletin T-501. This bulletin also contains complete information on diatomaceous earth and its application to water filtration. The bulletin features piping installation drawings and charts and tables pertaining engineering design and cost data.—PROPORTIONEERS, INC., PROVIDENCE 1, R. I.

Mechanized Accounting for Contractors.—Booklet describes economical mechanized accounting methods for Kardex problems. Designed especially for contractors and builders, the booklet shows how control of purchases can be achieved. An advantage of the Printing Calculator is that it prints out a tape indication of the arithmetical functions performed and the items used. The machine can be used to prepare payrolls, ledger balances and also provide data for compilation and government reports and check registers.—REMINGTON RAND, INC., 315 FOURTH AVE., NEW YORK 10, N. Y.

Brake Linings, Clutch Facings.—Free from materials for shovels, dragline cranes, tractors, and other industrial equipment are described in Catalog 1150, 100 pp. The bulletin illustrates various materials and their uses, lists factory-molded and cut-to-size clutch facings, gives specifications, and includes tips on installation and maintenance. Also listed are Carey Rock Drill Rammers, Maxi-Rammers, Inc., Manufacturers

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ENGINEERING NEWS-RECORD

Letter from WINNIPEG

STAND BY TO BLAST—Canadian Engineer Corps troops, left, place demolition charges on the roof of a house lodged against Winnipeg's Elm Park bridge. The blast, right, was designed to relieve pressure on the bridge. (Acme Photos)

With flood waters swirling around them at record heights, Winnipeg's citizens have been too busy for more than a month to worry much about what might have been done to avoid the flood.

But elsewhere in the Dominion, other Canadians have paused long enough in the general Winnipeg relief effort to study ancient reports of floods and surveys. One carries a "10-year-old warning."

It is futile," this report declared flatly, "to assume that the Red River shall never again overflow its banks. Man is utterly powerless to prevent the occurring periodically, and whenever it occurs, the disastrous consequences will be intensified in proportion to the increased numbers of inhabitants within the submerged districts."

The sage who called this shot so far back over the years was Sir Sandford Fleming, one of the greatest figures in Canadian engineering. Founder of the Standard time zones, Sir Sandford is spoken of as one of the greatest pioneer railroad engineers. He made the original survey for the Canadian Pacific Railway, and it was in his report to the Canadian government on this assignment, pointed to 1870, that he made his prediction.

Sir Sandford's report suggested the railroad cross the Red River at Lower Fort Garry, about 20 miles downstream, where the banks are rock and "an ample pass for the passage of flood waters." That location was rejected in favor of Winnipeg, a little pell-mell as shown Winnipeg grew at the city of the CPR's choosing point.

• **Eyes front.** But even as the waters lingered within a foot or two of its record height (30.5 ft above datum), Canada's emphasis on the Winnipeg flood was forward, toward the rebuilding, not backward to what might have been.

The Manitoba provincial government, for instance, is reported to be studying a plan for a $40,000,000 floodway to divert water around the city in the event of a similar catastrophe. Manitoba's Premier Campbell has announced that this appears to be one of the few practical plans. It entails a floodway east of the city from the Red River at St. Norbert, 10 miles south to Naird, 10 miles north of the city and about halfway between Winnipeg and Lake Winnipeg. The plan would remove some water from the Red River before new floods are pointed into it by the Assiniboine, which flows directly into the Red from the West, right in Winnipeg.

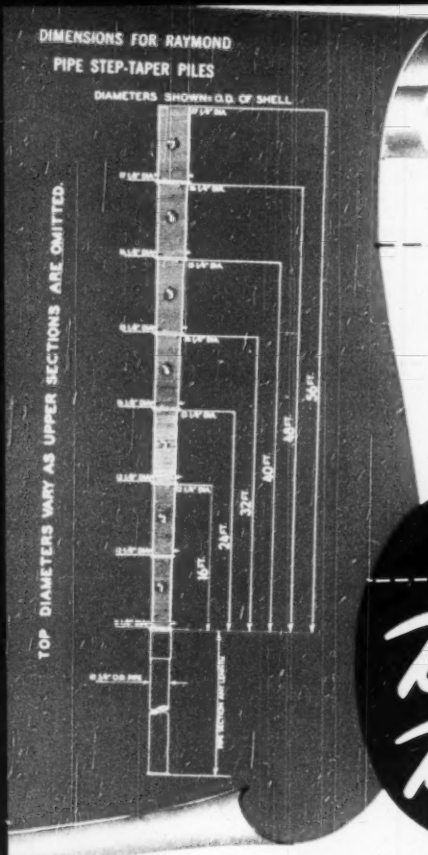
Such a floodway, it is claimed, would obviate the necessity of building dikes in Winnipeg proper. But it would do nothing for areas contiguous to the river between Emerson, at the International Border, and Winnipeg. For much of the 70 odd miles long between the city the Red River has become a lake as much as 10 miles wide. Over 600 sq mi of fertile farmland are thus now covered under water in the little stick.

And, of course, at the height of a disaster, long range plans for prevention of a recurrence often ring more or less hollowly. The immediate concern must be for the relief and protection of those whose lives and homes are at stake.

Whatever ultimately may be done to shield Winnipeg from future floods, it is clear at present that government officials are not going to be caught napping. Even before the flood waters had begun to recede, the need for government has been severely criticized in the press.

• **They didn't fail.** Engineers who are responsible for the works protecting the city can take pride in the fact that no major dikes had failed, a month after the flood hit the city. The municipal engineers have done their jobs equally well. As the flood's fifth week opened and the first signs of respite could be seen in dropping water levels south of the border, City Engineer W. D. Hurst and his staff (all local engineers, save registered for emergency service) had been able to preserve all municipal services. This had been possible, to be sure, only because of emergency equipment which had been flown and railed into Winnipeg from other Canadian cities. But it had been done, and it made unusual reading for citizens who are accustomed to disaster stories of darkened cities without communication.

• **Who's to pay?** Even before anyone knows what the bill will be, there's some very high level activity regarding how it shall be paid. A joint Dominion-Provincial commission has been established to investigate the allocation of flood damage costs between governments. It's to report "at the earliest possible moment," and its assignment is purely financial. Because the commission is thus limited, Ottawa anticipates further negotiations toward a federal-provincial rehabilitation program. Judging from the comparable performance at the time of the Fraser River Valley floods in 1948, the prospect is for a 75-25 split between the Dominion and Manitoba governments.



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MAKES 5 TYPES OF CONCRETE PILES

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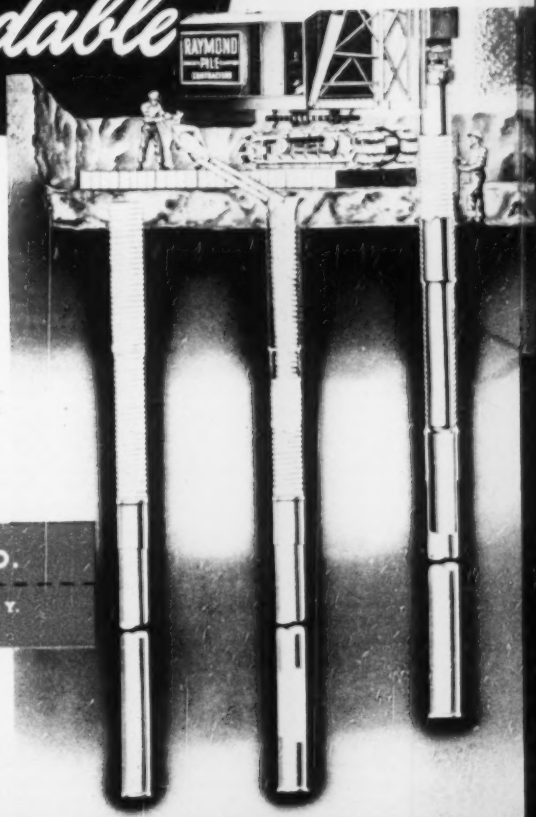
4. COMPOSITE . . . 5. GOW CAISSONS

Raymond installs every type of pile: cast-in-place concrete, precast concrete, steel pipe, wood and H-Beam. Raymond operations include underpinning, borings and soil investigations, waterfront construction and harbor and river improvements; also cement mortar linings of pipes by the Centriline Corporation, a Raymond Subsidiary.

3. PIPE STEP-TAPER PILES

Deep and Dependable



Raymond Pipe Step-Taper Piles are composed of an upper section of Step-Taper Shell Pile and a lower section of closed-end steel pipe pile. These piles are generally used to penetrate thick beds of soft soil to reach hard bottom at depths as great as 150 feet or more. The pipe step-taper pile is a most dependable pile available for reaching hard ground at great depths.

Raymond's methods result in efficiencies and substantial savings that are well worth investigating. Consult our engineers for more detailed information.

RAYMOND PILES MAINTAIN DRIVING RESISTANCE

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BRANCH OFFICES: Boston, Syracuse, Philadelphia, Baltimore, Washington, Pittsburgh, Atlanta, Miami, Houston, Kansas City, St. Louis, Cleveland, Chicago, Detroit, Salt Lake City, Portland, San Francisco, Oakland, Los Angeles and principal cities in Latin America

New Lorain-50 "Series" revolves on new TIMKEN® cone rollers

FOUR cone rollers in the new Lorain-50 "Series" of power shovels and cranes carry the weight of the entire upper structure including the bucket load.

The cone rollers are a new development of the Timken Company and assure a free, easy swing when the turntable revolves. Each cone roller is a complete Timken® tapered roller bearing—with inner races, rolls, cages, and outer race. It is the cone-shaped outer race of the Timken bearing itself upon which the turntable revolves. And like conventional Timken tapered roller bearings, the cone rollers take radial and thrust loads, have extra load carrying capacity and keep maintenance to a minimum.

Timken bearings take any combination of radial and thrust loads because of their tapered design. Line contact between rolls and races gives extra load-carrying capacity. And thanks to their true rolling motion and incredibly smooth surface finish, Timken bearings virtually eliminate friction. Shafts are held in positive alignment, reducing wear on surrounding parts.

Normally, Timken bearings last the life of the machine because they are (1) engineered for the job, (2) are made of Timken fine alloy steel, (3) are precision manufactured.

No other bearing offers *all* the advantages you get with Timken bearings. They have more than fifty years of bearing research and development behind them. Insist on Timken bearings in the machines you buy or build. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address, "TIMROSCO".

TIMKEN BEARING TOOLPPED — *This symbol on a product means its bearings are the best.*

THEW SHOVEL COMPANY, *Lorain, Ohio, uses Timken cone rollers to insure long life and trouble-free performance in the swing mechanism of their Lorain-50 "Series" shovels. Notice the cone roller and bearing are integral, the roller itself serving as the outer race of the bearing.*

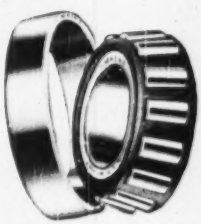
WE MAKE OUR OWN STEEL

The special grade alloy steel which gives Timken bearings their strength and resistance to wear, is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION